RM-AV2100T

SERVICE MANUAL

AEP Model

Ver 1.0 2000. 07

SPECIFICATIONS

Operating distance	Approx. 10 meters (32.8 ft.) (varies depending on components of different manufacturers)
Power requirements	Remote control and backlight: Four R6 (size AA) batteries
Battery life	Approx. 5 months (varies depending on frequency of use)
Dimensions	Approx. 120 × 175 × 45 mm (w × h × d) (4 3/4 × 7 × 1 13/16 in.)
Mass	290 g (10.22 oz.) (not including batteries)

Design and specifications are subject to change without notice.

INTEGRATED REMOTE COMMANDER

SONY

SECTION 1
GENERAL

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Notes on chip component replacement

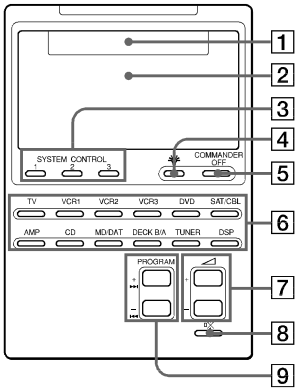
- Never reuse a disconnected chip component.
- Notice that the minus side of a tantalum capacitor may be damaged by heat.

Flexible Circuit Board Repairing

- Keep the temperature of soldering iron around 270°C during repairing.
- Do not touch the soldering iron on the same conductor of the circuit board (within 3 times).
- Be careful not to apply force on the conductor when soldering or unsoldering.

Location and Function of Controls

This section is extracted from instruction manual.



1 Component display area
Displays the name of the component selected.

2 LCD touch key display (page 11)
The keys used for operating each component are displayed.

Note
Do not press the touch keys using sharp objects such as pins or ball-point pens.

3 SYSTEM CONTROL buttons (page 23)
You can programme up to 16 consecutive key operations to each of the three SYSTEM CONTROL buttons. You can automatically carry out the entire programme by pressing one button.

4 ☼ button (page 48)
Used to light up the LCD display in the dark. Press the button once to turn on the light, and once again to turn it off. You can also set the backlight to go off automatically after a certain period of time.

5 COMMANDER OFF button
Turns the power of the Commander off.

6 Component Select buttons
Selects the component to control.

7 ◿ +/– buttons* (page 14, 22)
Adjust the volume.

8 🔇 button* (page 14, 22)
Mutes the audio. Press the button once again to resume at the previous volume.

9 PROGRAM +/– buttons
Select the programme.

**** Note on the ◿ +/– and 🔇 buttons***
The Commander controls or mutes the TV's volume when you select a visual component. The Commander controls or mutes the amplifier's volume when you select an audio component.
You can change this setting also (page 22).

Note on the power on and off of the Remote Commander
To turn on the power, press any button except the COMMANDER OFF button.
To turn off, press COMMANDER OFF, or if you don't use the Commander, it automatically turns off after 10 minutes. This interval can also be changed (page 47).

Setting the Code for Preset Audio and Visual Components

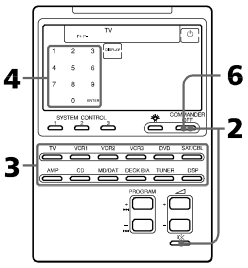
The Commander is preset at the factory to operate Sony brand AV components (see the table below). If you are using the Commander with a factory-set Sony components, skip the following procedures.
You can use the Commander with other preset AV components also. To use with other AV components, you need to follow the procedures to set the correct codes for each component.

Component Select Button	Preset component(s)	Factory setting
TV	TV TV/VCR Combo	Sony TV
VCR1	VCR	Sony VHS VCR (VTR3)
VCR2	VCR	Sony 8mm VCR (VTR2)
VCR3	VCR	Sony Beta VCR (VTR1)
DVD	DVD player (DVD)/LD player (VD)	Sony DVD player
SAT/CBL	Satellite tuner (SAT)/Cable box (CBL)	Sony satellite tuner (SAT)
AMP	Amplifier	Sony amplifier
CD	CD player	Sony CD player
MD/DAT	MD deck/DAT deck	Sony MD deck
DECK B/A	Cassette deck*	Sony cassette deck
TUNER	FM/AM tuner	Sony FM/AM tuner
DSP	Surround processor	Sony digital surround processor

* Analog audio compact cassette deck

See "Table of Preset Functions" (page 56) for the functions of keys and buttons as for each component.

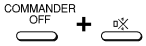
Setting a component code



Example: To set up a Philips' TV

1 See the tables in the supplied "Component Code Numbers", and find the three-digit code number for the desired component.
If more than one code number is listed, use the number that is listed first.
For example, to set up a Philips' TV, you would use the code number 011.

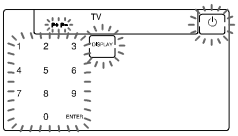
2 While pressing COMMANDER OFF, press ⌧.



All the component names in the display flash.

3 Press the Component Select button for the desired component.

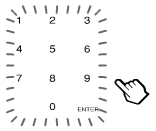
The selected component remains displayed, and the 0 – 9, ENTER and DISPLAY keys flash.



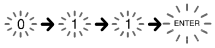
Note on the DVD and SAT/CBL buttons
When you set the component code of the DVD or SAT/CBL button, press repeatedly until the desired component is displayed ("DVD" or "VD", "CBL" or "SAT").

Note on the DECK B/A button
You have to set one component code each for DECK A and DECK B. Press the DECK B/A button repeatedly until the desired deck is displayed ("DECK A" or "DECK B"), and set a component code for it.

4 Press the three-digit component code number followed by the ENTER key on the touch-key display.



A beep sounds, and the code number and "ENTER" appear twice.



5 If you want to set a code for another component, repeat Steps 3 and 4.

6 Press COMMANDER OFF.

Continued

Setting the Code for Preset Audio and Visual Components (continued)

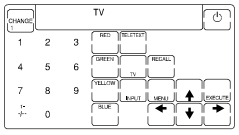
Notes
- If you press a component code number that is not on the table in the supplied "Component Code Numbers", the Commander beeps and "NG" flashes after you press the ENTER key. If this happens, check the component code number, and try setting again.
- If you don't input anything into the Commander for over two minutes between each step, the setup procedure will be canceled. To set the code, you must again press ⌧ while pressing COMMANDER OFF.

To check which code number is set
Press the DISPLAY key in Step 3 to 5. The code number and "ENTER" appear twice.

Checking if the code number works

1 Press the corresponding Component Select button for the component you have set up.

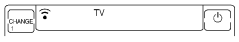
The Commander turns on and the touch-keys appear on the display.



2 Power on the component with its power switch.

3 Aim the Commander at the component and press the ⏻ key in the touch-key display.

When the remote control signal is sent, ᯤ is displayed on the display.



The component should power off.

4 If you have succeeded, check that the Commander is operating the other functions of your component, such as programme and volume control.
See page 13 for details.

5 Press COMMANDER OFF.

If the Commander does not seem to be working
Try repeating these setup procedures using the other codes listed for your components (page 8).

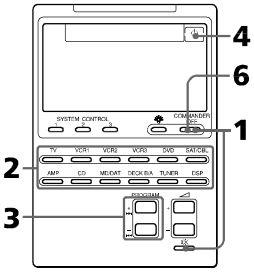
Notes on keys which have "learned" a remote control signal already
If another signal has already been programmed on that key or button by the learning function (page 16), that "learned" signal will work even after you set the component code number. To use it as a preset component key or button, first erase its learned signal (page 20).

Note on the touch-key display
When you set a component code number, only the keys that have been preset with the signals for the desired component will be displayed. Preset signal of each key varies according to the brand.
By using the learning function, you can programme remote control signals to both the displayed keys and keys that are not displayed (page 16).
You can also choose either the full-function display or the basic-function display (page 50).

Finding a component code with the Search function

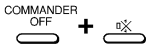
You can find a code number available for a component that doesn't have one in the supplied "Component Code Numbers".

Before starting the Search function
Set each component to the following status to enable the Search function.
TV: Power-on
VCR, DVD, SAT, CBL, AMP: Power-off
VD, CD, MD, TAPE: Power-on with a playback source (disc, cassette tape, etc.)



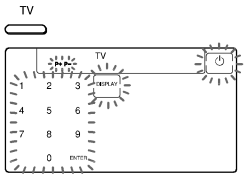
Continued

1 While pressing COMMANDER OFF, press ⊘.



All the component names on the display flash.

2 Press the Component Select button for the desired component.

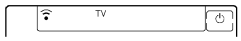


3 Press PROGRAM + or PROGRAM –.

Press PROGRAM + to go to the next code number.
Press PROGRAM – to go back to the previous code number.

4 Aim the Commander at the component and press the ⏻ key.

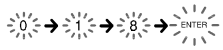
When the remote control signal is sent, ᯤ is displayed on the display.



If it successfully works (power-off for TV, power-on for VCR, DVD, SAT, CBL, AMP, and playback for VD, CD, MD, TAPE), go to Step 5.
If it doesn't, repeat Steps 3 and 4.

5 Press the ENTER key.

A beep sounds, and the code number and "ENTER" appear twice.



Note

It is recommended to write down the code number.

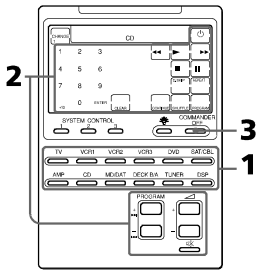
6 Press COMMANDER OFF.

To check which code number is set

Press the DISPLAY key in Step 2 and 5. The code number and "ENTER" appear twice.
Be sure to press the DISPLAY key after you have pressed the ENTER key to set the code number. If you press the DISPLAY key before the code number is set, it returns back to the first number at which you started searching.

Operating Your Components with the Remote Commander

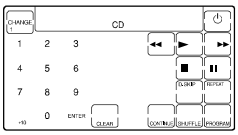
When you operate a non-Sony component, make sure you set the component code first (page 8).



Example: To play a CD player

1 Press the desired Component Select button.

The Commander comes on and the keys for operating the selected component are displayed.



Continued

2 Press the desired key in the touch-key display.

When the remote control signal is sent, ᯤ is displayed on the display.

You may also use the ◿ +/– buttons, the ⊘ button and the PROGRAM +/– buttons if necessary.
See "Table of Preset Functions" (page 56) for the functions of keys and buttons for each component.

3 When you are done using the Commander, press COMMANDER OFF to power off the Commander.

Note

The remote control signals may be different for some components or functions. In this case, programme the remote control signals with the learning function (page 16). Note, however, that components and functions that do not support the remote control of infrared signals will not work with this Commander.

To control the volume

Press the ◿ +/– buttons to control the volume, and the ⊘ button to mute.
When you select a visual component, the TV's volume will be controlled, and when you select an audio component, the amplifier's volume will be controlled.
You can change this setting also (page 22).

Notes

- **If you have programmed any signal for the ◿ or ⊘ button for any component using the learning function (page 16), that signal will be transmitted instead of controlling the volume of the TV or amplifier once you select that component.**
- **If you have programmed any signal for the ◿ or ⊘ button of TV or AMP using the learning function, that signal will be transmitted only after you select TV or AMP. When you select another components, the preset volume control signals for TV or AMP will be transmitted at that time.**
- **If you have assigned another component to the TV or AMP button (page 35), the volume of the TV or amplifier cannot be controlled even when you select other components.**

Notes on operating your components

When you use a double cassette deck

You need to select deck A or B before operating. To select the deck, press DECK B/A to switch the display between "DECK A" and "DECK B".
Be sure that you have set a component code each for DECK A and DECK B (page 8).
However, if you have assigned a cassette deck to another Component Select button (page 35), you can only select either DECK A or DECK B.

About the input select of a TV

Each time the INPUT key is pressed, the input is changed in order. It is also possible to select directly as follows when you are connecting more than two VCRs.
"INPUT" + "0": TV tuner
"INPUT" + "1": VIDEO1
"INPUT" + "2": VIDEO2
"INPUT" + "3": VIDEO3
"INPUT" + "4": VIDEO4
"INPUT" + "5": VIDEO5
"INPUT" + "6": VIDEO6
If the above operations do not work, programme the remote control signals of your component on the Commander using the learning function (page 16).

About the input select of a VCR

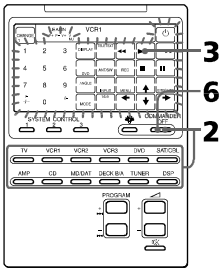
Each time the INPUT key is pressed, the input is changed in order. It is also possible to select directly as follows.
"INPUT" + "0": Tuner
"INPUT" + "1": LINE1
"INPUT" + "2": LINE2
"INPUT" + "3": LINE3
"INPUT" + "4": LINE4
"INPUT" + "5": DV
When you use a Sony VCR, the above commands are preset. For other brands, it is possible to "teach" the above double-key operations using the learning function (page 16).

Using Non-Preset Remote Control Operations

— Learning Function

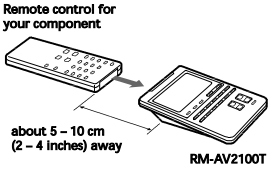
To operate non-preset components or functions, use the following "learning" procedure to "teach" any of the programmable buttons and keys to operate the functions of another remote control. You can also use the learning function to change the signal of individual keys and buttons after setting the component code number (page 8). It is useful if you make a memo of the learned key functions in the LCD touch key display table (Refer to the separate volume of "Component code numbers.").

Note
Some specific remote control signals may not be learned.

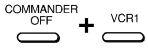


Example: To programme the ► (Play) signal of your component to the VCR1 ► (Play) key of the Commander

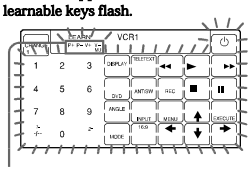
1 Place the RM-AV2100T head to head with your component's remote control.



2 While pressing COMMANDER OFF, press the Component Select button for the component whose signals are to be learned.



"LEARN" appears and all the learnable keys flash.



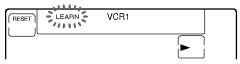
Display for PROGRAM, ◿ and 🔇 buttons

The "P+ P- V+ V- MU" display indicates if PROGRAM +/–, ◿ +/– and 🔇 buttons are learnable or not.

Note on the flashing display
The keys or buttons that are already preset for that component flash twice while those that are not preset flash once.

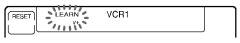
3 Press the key or button on the Commander you want to "teach".

"LEARN" flashes and the only pressed key remains on the dislplay.



To teach on the PROGRAM +/–, ◿ +/– or 🔇 buttons
Press the corresponding button. "LEARN" flashes, and only the pressed button remains indicated on the display ("P+," "P–," "V+," "V–," or "MU").

Example: When pressing the ◿ + button



To change the function display of the key
Follow the procedure on page 19.

4 Press and hold down the button on the other remote control until you hear a beep.
(If you release the button before you hear a beep, the signal may not be learned correctly.)

"LEARN" stops flashing and stays lit. When the command has been learned successfully, the learned keys stay lit and the other learnable keys flash.

If "NG" flashes on the display
Learning did not succeed. Try Steps 3 and 4 agaln.

5 Repeat Steps 3 and 4 to teach functions to other kyes or buttons.

To learn another component's remote control signal
After positioning the two remote commanders as in Step 1 on page 16, press the corresponding Component Select button, and then follow Steps 3 and 4 on the left to perform learning.

6 Press COMMANDER OFF.

Continued

Using Non-Preset Remote Control Operations
— Learning Function(continued)

Notes
- If you do not perform learning steps within two minutes, learning mode ends.
- If you do not perform Step 4 within 10 seconds after Step 3, the display turns back to the display in Step 2. (All the learnable keys flash.) In this case, perform Step 3 again while the display is flashing.
- If "NG" appears while learning, the memory is full. To free memory, clear learned functions from keys that you do not use often (page 20). Then continue the learning steps.
- If you touch a key by mistake in step 4, while pressing the RESET key, press the mistaken key. Then repeat from Step 3 to continue learning.

If the Commander does not seem to be working
If the learned key or button does not operate properly, teach once again. (For example, if the volume becomes very loud after pressing the ◿ + button only once, noise may have interfered during the learning procedure.)

If you set a component code after learning a signal
If you have programmed any signal for a key or button using the learning function, that signal will remain assigned to that key or button even after you set a component code.

When you teach the signals for a double cassette deck
Press DECK B/A to select deck A or B.

When you teach the REC (record) signal
If you have to press two buttons at the same time (for example, REC and ▶) to start recording on your cassette deck or VCR, teach the REC signal in one of the following ways.

To operate with two keys on the Commander
In Step 3 (page 17), while pressing the REC key, press the ▶ key to display both keys. Then press the two buttons on your component's remote control in Step 4.

To operate with one key on the Commander
In Step 3 (page 17), press only the REC key. Then press the two buttons on your component's remote control in Step 4.

When you teach signals to the ◿ or 🔇 buttons
- If you have programmed any signal on the ◿ or 🔇 button for components other than TV and AMP using the learning function, that signal will be transmitted only when you select that component.
- If you have programmed any signal on the ◿ or 🔇 button for TV or AMP using the learning function, that signal will be transmitted only when you select TV or AMP. When you select other components, the preset volume control signals for TV or AMP will be transmitted (for the difference between visual components and audio components, see page 22). To use the learned signal, you need to programme the ◿ or 🔇 button for each component using the learning function.

When you teach the signals of an air-conditioner
See the notes on page 39.

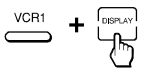
To display only the frequently used keys
You can hide keys you do not use. This makes operations even easier to understand, when the components have many keys.

After Step 2 on page 16, while pressing the RESET key, press the key you want to hide (flashing). The pressed key changes to slower flashing and will no longer be displayed during remote control operations.
To display it again, perform the same procedure again.

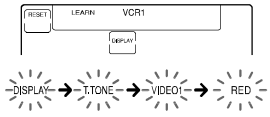
Note
You can not hide a key which has "learned" any signal.

To change the function display of a key
When you programme a signal for a key, you can select the most suitable function display among all the displays the key has, and set it to the key.

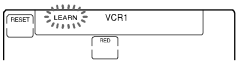
1 After Step 2 (page 16), while pressing the Component Select button (VCR1), press the key you want to teach repeatedly.



Each time the key is pressed, the display is changed in order.



2 When the desired display appears, release the Component Select button.



3 Then follow Steps 4 to 6 (page 17).

Notes
- You can change the display of a key only when you programme it using the learning function. If you want to change the display of the key that has learned a signal, clear the signal first (page 20). Then teach the key again using the above procedure to change its display.
- If you don't change the display of a key, the default display is used.
- You cannot change the display of the keys that are not framed with ☐ (the numeric keys 0 to 9, +10 and ENTER).

Continued

For accurate learning

- Do not move the remote units during the learning procedure.
- Be sure to keep holding down the button of the other remote control until you hear the confirmation beep.
- Use fresh batteries in both remote control units.
- Avoid learning in places under direct sunlight or a strong fluorescent light.
- The remote control detector area may differ depending on each remote unit. If learning does not work, try changing the positions of the two remote control units.
- When you teach signals of an interactive signal exchange system remote control unit (supplied with some of Sony's receivers and amplifiers) to the Commander, the response signal of the main unit may interfere with the learning of the Commander. In such a case, move to a place where the signals will not reach the main unit (e.g. other rooms, etc.).

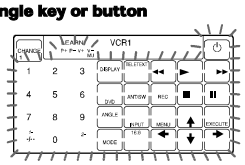
IMPORTANT
Be sure to place the Commander out of the reach of small children or pets. Also set the Hold function to lock the all buttons on the Commander (page 45) when it is not used. Components such as air conditioners, heaters, electric appliances, and electric shutters or curtains receiving an infrared signal can be dangerous if misused.

Note
For details on the learnable remote control signals, see "Specifications" on page 52.

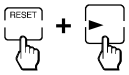
Changing or erasing the function of a taught key or button

To change the learned function, clear it first and perform learning again.

To clear the learned function of a single key or button



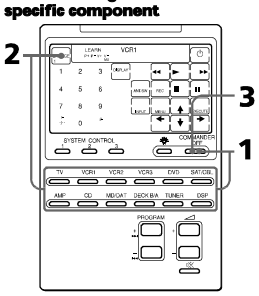
1 After Step 2 (page 16), while pressing the RESET key, press the key or button you want to erase.



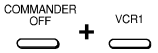
The cleared key flashes together with other learnable keys.

2 Press COMMANDER OFF.

To clear all signals learned for a specific component

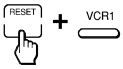


1 While pressing COMMANDER OFF, press the corresponding Component Select button.



When you want to clear signals learned for DECK B/A
Press DECK B/A to display "DECK A" or "DECK B". You can not clear both decks at the same time.

2 While pressing the RESET key, press that Component Select button again.
The learned contents are cleared. The keys for the component return to their original states before learning.



3 Press COMMANDER OFF.

Note
For DECK B/A, be sure to display the deck that has a learned signal ("DECK A" or "DECK B") before you perform the steps above. If you reset the wrong deck, the component codes for both A and B will be reset to the factory settings (page 8).

Controlling the Volume of Visual Components Connected to an System

The Commander is factory preset based on the assumption that you hear the sound of your visual components from your TV speakers, and that you hear sound of your audio components from the loudspeakers connected to your amplifier.

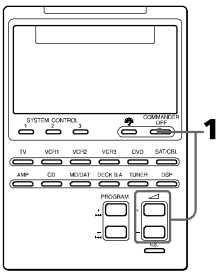
This feature enables you to control the volume of your TV or amplifier without having to select TV or AMP each time you want to control the volume.
For example, to control the volume while using a VCR, you don't need to press the TV button to control the TV volume.

The following table shows the factory setting of which volume would be controlled for each component.

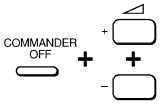
Component Select button	Controls the volume of
TV	TV
VCR1,2,3	TV
SAT/CBL	TV
DVD	TV
AMP	amplifier
CD	amplifier
MD/DAT	amplifier
DECK B/A	amplifier
TUNER	amplifier
DSP	amplifier

However, if your visual components are connected to an audio system, you probably hear TV or VCR sound from the loudspeakers via your amplifier, not from your TV speakers. In this case, you need to change the factory preset so that you can control the volume of your visual components without first having to switch to the amplifier.

To change the Factory Preset of the Volume Control

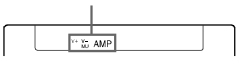


1 While pressing COMMANDER OFF, press ◿ + and ◿ –.



The volume control setting of visual components (TV, VCR1,2 and 3, SAT/CBL, and DVD) changes to the displayed component.

When set to amplifier volume → AMP
When set to TV volume → TV



Notes
- If you have already programmed the ◿ or 🔇 button of each component any signals by "learning", the procedure above will not change the function of the ◿ and 🔇 buttons.
- If you have programmed volume control signals on ◿ or 🔇 buttons of TV or AMP, you can only use that signal when you select TV or AMP. For other component, the preset volume control signals for TV or AMP (depending on the above setting procedure) will be transmitted. To use the new signals, you need to programme each button for each component by the learning procedure (page 16).

Executing a Series of Commands

— System Control Functions

With the System Control function, you can programme a series of operating commands, and execute them by pressing just one button.
For example, when you watch a video, a series of operations like the ones below are necessary.

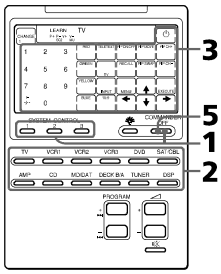
Example:
1 Power on the TV.
2 Power on the video (VCR 1).
3 Power on the amplifier.
4 Set the input selector of the amplifier to VIDEO 1.
5 Set the input mode of the TV to VIDEO.
6 Start video playback

You can programme up to 16 consecutive operation steps to each of the SYSTEM CONTROL 1, 2 or 3 buttons.
If you have set the System Control function for a Component Select button (page 28), the execution of the programmed commands begins when you press the Component Select button for more than 2 seconds.

While executing the programmed commands, at the same time that each remote control signal is transmitted, the corresponding key is displayed.

Continued

Programming a series of commands to the SYSTEM CONTROL buttons



Example: To programme the procedure above to the SYSTEM CONTROL 2 button

1 While pressing COMMANDER OFF, press one of the SYSTEM CONTROL buttons (in this case, SYSTEM CONTROL 2).

COMMANDER OFF + SYSTEM CONTROL 2

All the component names flash.

If a series of commands is already programmed for that button

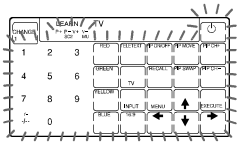
That programme will be displayed. (At the factory, the SYSTEM CONTROL 1 button is preset with the System Power-Off function for Sony components (the same function as explained in page 34), and the SYSTEM CONTROL 3 button is factory preset with standard power-on command for nearly all Sony components.)

To programme a new series of operations, clear the programme first (page 26).

2 Press the Component Select buttton for the component to operate.

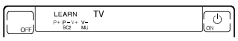
TV

The keys for the selected component flash.



If the component has the power-on and power-off signals

Both the OFF and ON keys are displayed and you can select either of them to programme.



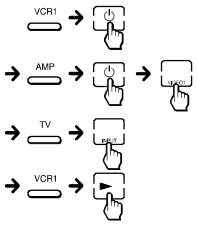
It is useful to set the exact command for power-on or power-off and operate the component regardless of its status (on/off).

3 Press key(s) or button(s) for the desired operation.

If you want to power on the TV, press the ⏻ key.

4 Repeat Steps 2 and 3 and programme the buttons and keys for the series of operations.

In this example, press the following buttons and keys.



5 When you have programmed all the keys, press COMMANDER OFF.

COMMANDER OFF

Notes

- If you interrupt the procedure at any point for over two minutes, the setting mode ends and the series of commands will be programmed to that point. In this case, clear the programme (page 26) and start again from Step 1 to set the entire programme from the beginning. You cannot continue from where you let off.
- If a SYSTEM CONTROL button has already "learned" a remote control signal (page 38), "NG" flashes and you cannot programme on this button. Clear the learned contents first (page 40).
- If you change the component code number (page 8) or programme a new signal by learning (page 16) on a key or button that has been programmed in the series of commands of the System Control function, the new signal will be transmitted when you press the corresponding SYSTEM CONTROL button.
- During Setting mode, the RESET key is not displayed and you cannot clear any operation step you have programmed. If you have programmed an incorrect operation by mistake, start again from Step 1.

Tips for programming the System Control functions

The following information helps you to programme a consecutive operation steps.

About the interval between operation steps

You can change the interval between operation steps (page 30).

Continued

About the order of operation steps

- Some of the components may not accept consecutive remote control signals. For example, a TV generally does not react to next signal right after the Power-on signal. So, a series of commands such as TV Power-on and input select may not work properly. In this case, insert other signals like the example below;

  TV Power-on → VCR Power-on → VCR play back → TV input select

- After the series of input commands is executed, the Commander displays the touch-keys of the component of the final step. By programming an often-used component's command as the final step, you can save the step of pressing a Component Select button when you start operating that component. (In the example on page 24, the touch-keys of VCR1 are displayed.)

To clear programmed commands

1 While pressing COMMANDER OFF, press one of the SYSTEM CONTROL 1, 2, or 3 button.

COMMANDER OFF + SYSTEM CONTROL 2

The key operations programmed for that button are displayed in order.

2 While pressing the RESET key, press the same SYSTEM CONTROL button (1, 2, or 3) again.

RESET + SYSTEM CONTROL 2

When the contents of its programme are cleared, all the component names flash.

When you want to set a new programme to this SYSTEM CONTROL button, follow Steps 2 to 5 on pages 24 and 25.

To set the SYSTEM CONTROL 1 or 3 button back to the factory setting

At the factory, the SYSTEM CONTROL 1 button is preset with a series of power-off commands for Sony components and the SYSTEM CONTROL 3 button with a series of power-on commands for Sony components. To reset them to the factory settings, follow the steps below.

1 While pressing COMMANDER OFF, press the SYSTEM CONTROL button (1 or 3).

COMMANDER OFF + SYSTEM CONTROL 3

The programmed key operations are displayed in order.

2 While pressing the RESET key, press the SYSTEM CONTROL button (1 or 3).

RESET + SYSTEM CONTROL 3

When the contents of its programme are cleared, all the components names flash.

3 While pressing the RESET key, press the SYSTEM CONTROL button (1 or 3) again.

RESET + SYSTEM CONTROL 3

When it is reset to the factory setting, the programmed operations are displayed in order.

Note

The interval setting (page 30) is not reset to the factory setting, even if you perform these steps.

Notes on System Control Operations

- If the remote control detectors of the components are too far apart, or if something is blocking them, some of the components may not operate consecutively even after you press the SYSTEM CONTROL button.
- If some of the components did not operate correctly because of the above or for any other reason, always set all the components back to the states they were in before you pressed the SYSTEM CONTROL button. Failure to do this can result in incorrect operation when you press the SYSTEM CONTROL button again.
- Some components may not always be powered on by the System Control function. This is because the power of the component gets on and off alternatively when receiving the power on/off signal. In this case, check the operating component's power on/off state before using the system control function.
- If the system control function does not work correctly, see also "Tips for programming the System Control functions" on page 25.

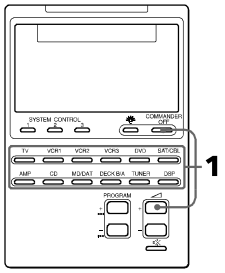
Continued

Programming a series of commands to the Component Select buttons

As with the SYSTEM CONTROL buttons, you can also programme a series of operating commands for the Component Select buttons (up to 16 steps).
To execute the commands programmed on a Component Select button by the System Control function, press the button for more than 2 seconds.

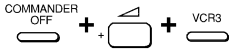
Notes

- The programmed commands are executed when you press a Component Select button for more than 2 seconds. When you press the button for less than 2 seconds, it works as the normal Component Select button, and the corresponding touch-keys are displayed.
- See also "Tips for programming the System Control functions" on page 25 and "Notes on System Control Operations" on page 27.



Example: To programme the procedure on page 23 for the VCR3 button

1 While pressing COMMANDER OFF, press ◿ + and VCR3.



"VCR3" stays lit, and the other component names flash.

If a series of commands is already programmed for that button
The programmed operations are displayed in order. To programme a new series of operations, clear the programme first (page 29).

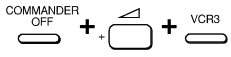
2 Follow Steps 2 to 5 on pages 24 and 25.

Notes

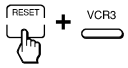
- You can programme the System Control functions for a Component Select button on which the Power-On function (page 31) has been programmed. In this case, the Power-On function is overwritten and cannot be used. If you clear the System Control functions for the button, the Power-On function is resumed, and you can use it again.
- You cannot programme the System Control functions for a Component Select button for which a signal has been programmed by "learning" (page 32). ("NG" flashes on the display.)
- You can programme a signal for a Component Select button by "learning" (page 32) for which the System Control functions have been programmed. In this case, the System Control function is overwritten and cannot be used. If you clear the "learned" signal on the button, the System Control function is resumed and you can use it again.
- You can programme the Power-On function (page 31) for a Component Select button for which a System Control function has been programmed, but the Power-On function cannot be used. If you clear the System Control function from the button, you can use the Power-On function.
- If you interrupt the procedure at any point for over two minutes, the setting mode ends and the series of commands will be programmed to that point. In this case, clear the programme and start again from Step 1 to set the entire programme from the beginning. You can not continue from where you let off.
- If you change the component code number (page 8) or programme a new signal by learning (page 16) for a key or button that has been programmed with the series of commands of a System Control function, the new signal will be transmitted when you press the corresponding Component Select button.

To clear a System Control function programmed for a Components Select buttons
Example: To clear the programmed commands on the VCR3 button

1 While pressing COMMANDER OFF, press ◿ + and VCR3.



2 While pressing the RESET key, press VCR3.



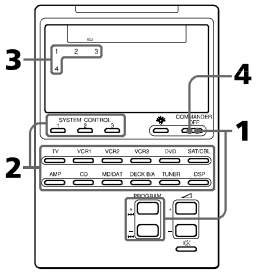
When the contents of its programme are cleared, "VCR3" stays lit, and the other component names flash.

When you want to set a new programme to this Component Select button, follow Steps 1 to 2 on page 28.

Continued

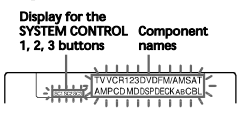
Changing the interval between operation steps

You can control the interval in 4 steps (approx. 127 ms, 408 ms, 708 ms, 974 ms).



1 While pressing COMMANDER OFF, press PROGRAM + and PROGRAM –.

"SC1," "SC2," "SC3" and all the component names flash.


Display for the SYSTEM CONTROL 1, 2, 3 buttons
Component names
SYSTEM CONTROL
TV VCR1 2 3 DVD FM/AM SAT
AMP CD MD DAT DECK A/B CBL

2 Press one of the SYSTEM CONTROL buttons (1, 2, or 3) or the Component Select button whose interval you want to change.

SYSTEM CONTROL
2

The number of the current setting stays lit and other numbers flash.

3 Press one of the numeric keys (1 – 4) to select the interval.

1: approx. 127 ms (factory setting)
2: approx. 408 ms
3: approx. 708 ms
4: approx. 974 ms
(1 ms: 1/1000 second)

The selected number stays lit and other numbers flash.

4 Press COMMANDER OFF.

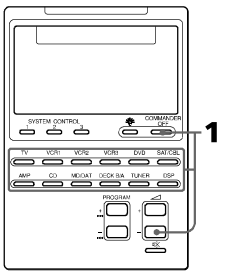
COMMANDER OFF

Continued

Adding an Extra Function to the Component Select Buttons

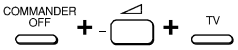
Programming the Power-On command of the selected component (for Sony components only)

When using Sony components, you can programme the Power-on signal for each component on a Component Select button. You can select the desired component and power it on by just pressing that Component Select button.



Example: To programme the TV button

1 While pressing COMMANDER OFF, press ◿ – and the desired Component Select button.



When the Power-on command is programmed, you will hear a beep and "⏻ ON" appears on the display. (The display goes off when you release the buttons.)

To clear the Power-on command
Repeat the procedure above.
The following display appears.

Notes

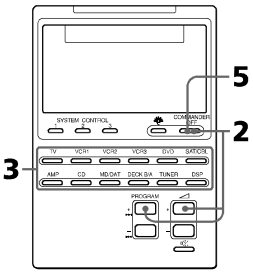
- If the component code of a non-Sony product has been set for a Component Select button, you cannot programme the Power-On function for it.
- Even if you have programmed a signal by "learning" (See "Adding a command that is required when selecting a component.") or a System Control function (page 28) for a Component Select button, you can programme the Power-On function for that button, but it cannot be used. If you clear a "learned" signal or the System Control function from the button, you can use the Power-On function.
- You can programme a signal by "learning" (page 32) or a System Control function (page 28) for a Component Select button for which the Power-On function has been programmed. In this case, the Power-On function is overwritten and cannot be used. If you clear the "learned" signal or the System Control function from the button, the Power-On function is resumed, and you can use it again. If you have programmed both a signal by "learning" and a System Control function for the button, the "learned" signal will have overwritten the System Control function.

Adding a command that is required when selecting a component

In addition to the original function of selecting the operating keys and buttons of the desired component, the Component Select button can have another remote control signal by "learning."
For example, if you always have to change input select of the amplifier to CD when listening to the CD player, programme the signal of "changing the amplifier's input select" to the CD button of this Commander. Then whenever you press the CD button, it automatically works as the original CD Component Select button and changes also the amplifier input select to CD. (In this case, the amplifier should be turned on first.)

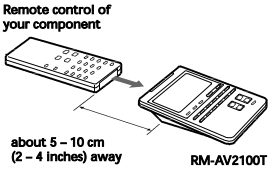
Note

Some specific remote control signals may not be learned.

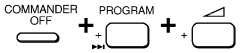


Example: To programme the input select signal of your amplifier to the CD button

1 Place the RM-AV2100T head to head with your component's remote control.



2 While pressing COMMANDER OFF, press PROGRAMME + and ◿ +.



"LEARN" appears and all the component names flash.

Note

The name of a Component Select button for which a signal has already been learned stays lit. If you want to programme a new signal for that button by learning, clear the learned signal first (page 34).

3 Press the desired Component Select button.

The selected component name stays lit and "LEARN" flashes.

4 Press and hold down the button on the component's remote control (amplifier in this example) until you hear a beep.
(If you release the button before you hear a beep, the signal may not be learned correctly.)

"LEARN" stops flashing and stays lit.

If "NG" flashes on the display

Learning did not succeed. Try Steps 3 and 4 again.

5 Press COMMANDER OFF.

Continued

To clear the learned function of the Component Select button

1 While pressing COMMANDER OFF, press PROGRAM + and ◿ +.

2 While pressing the RESET key, press the Component Select button which you want to clear.

Notes

- You can programme a signal by "learning" for a Component Select button for which a System Control function (page 28) or the Power-On function (page 31) has been programmed. In this case, the System Control function or the Power-On function is overwritten and cannot be used. If you clear the "learned" signal from the button, the System Control function or the Power-On function is resumed, and you can use it again.
- You cannot programme a System Control function (page 28) for a Component Select button for which a signal has been programmed by "learning."
- You can programme the Power-On function for a Component Select button for which a signal has been programmed by "learning," but then the Power-On function cannot be used. If you clear a "learned" signal from the button, you can use the Power-On function.

Turning Off the Power of All Components with the Touch of a Single Button

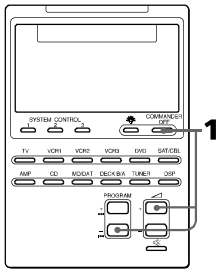
— System Power-Off Function (for Sony Components only)

When the System Power-Off function is active, you can turn off all Sony components just by pressing the COMMANDER OFF button for three seconds.

Notes

- Some Sony components may not be turned off with this function.
- The power-off signals are transmitted at intervals that are set for the System Control function set for the SYSTEM CONTROL 1 button (page 30). If you change the interval for the SYSTEM CONTROL 1 button, the interval of the System Power-Off function is also changed.

To set the System Power-Off function



1 While pressing COMMANDER OFF, press PROGRAM – and ◿ +.

When the System Power-Off function is set, "⏻ OFF" appears on the display. (The display goes off when you release the buttons.)

To cancel the System Power-Off function

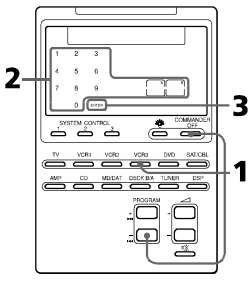
Repeat the procedure above. The following display appears when the System Power-Off function is disabled.

Assigning Other Components to the Component Select Buttons

You can assign another component to any Component Select button. For example, if you have two VCRs and two CD players, you can use the VCR3 button as the Component Select button for your second CD player.

Notes

- Once you assign another component to a Component Select button, the setting of the component code number will be erased. The component code number will not return even if you reset the newly assigned component and turn back to the original component.
- If you have assigned another components to the TV or AMP button, the volume of the TV or amplifier cannot be controlled (page 14, 22) even when you select another component.
- If you use the DECK B/A button, deck B is always selected.



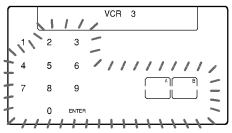
Continued

Assigning Other Components to the Component Select Buttons (continued)

Example: To assign a CD player to the VCR3 button

1 While pressing COMMANDER OFF, press PROGRAM + and VCR3.

The number 0 - 9, "A", "B" and "ENTER" flash.



2 Press one of the following keys to select a new component to assign.
In this example, press the 5 key to select CD.

1: VCR	7: MD
2: VD	8: TV
3: SAT	9: CBL
4: AMP	0: DVD
5: CD	A: FM/AM
6: DECK	B: DSP

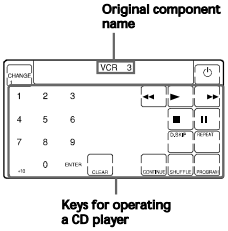
3 Press the ENTER key.

"VCR3" (the original component), "CD" (the new component) and "ENTER" appear twice.

4
- If the newly assigned component is a Sony component, press COMMANDER OFF to finish this procedure.
- If you need to set the component code, follow the steps on pages 8 and 9.
- If you need to programme some signals by the "learning" function, follow the Steps 1 to 6 on pages 16 and 17.

Note
If "NG" flashes on the display when you press the Component Select button at Step 1, you can not assign another component because some of the keys or buttons are already programmed with the learning function (page 32).
Try the above procedure again after clearing the learned signals for that component.

To use the Commander after assigning other components
Press the reassigned Component Select button. The keys of the new component are displayed and you can use the desired component. Note however that only the original component name is displayed.
(In this example, the display would be like the one below.)



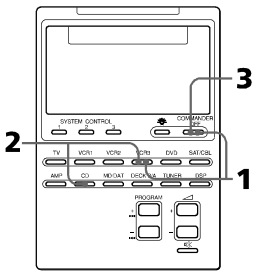
To reset a Component Select button to its original setting
1 While pressing COMMANDER OFF, press the Component Select button which you want to reset.
2 While pressing the CHANGE key, press that Component Select button again.
The setting for that Component Select button returns to the factory setting.
3 Press COMMANDER OFF.

Note
If you have programmed some signals on any of the keys or buttons with the learning function (page 16) after you reassigned your component, the two steps above only clears the "learned" signals. In this case, perform Step 2 again to reset to the original Component Select button.

Copying the settings of a Component Select button to another button

You can copy the entire settings of a Component Select button to another Component Select button. The settings of the component code (page 8) and the learned functions (page 16) are copied to a new button.

Note
You cannot copy the settings to a Component Select button for which any learning function has been programmed. ("NG" flashes.)



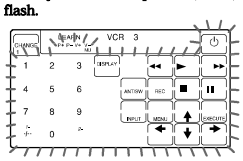
Continued

Assigning Other Components to the Component Select Buttons (continued)

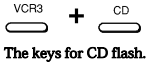
Example: To copy the settings of the CD button to the VCR3 button

1 While pressing COMMANDER OFF, press VCR3.

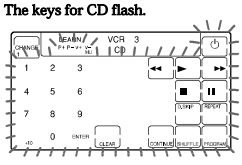
The keys for that component (VCR3) flash.



2 While pressing VCR3, press CD.



The keys for CD flash.

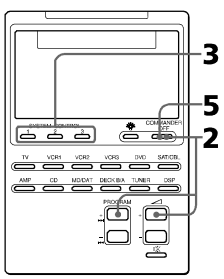


3 Press COMMANDER OFF.

Programming a Frequently Used Key Operation for SYSTEM CONTROL Buttons

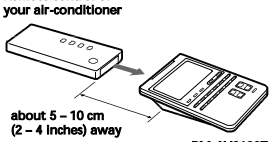
In addition to their original System Control functions (page 23), SYSTEM CONTROL 1, 2 or 3 buttons can be programmed to "learn" any remote control signal.
As they operate independently from other buttons, SYSTEM CONTROL 1, 2 or 3 buttons can work as one-touch buttons without any preceding operation such as pressing a Component Select button to select a component.
This is useful if you prefer having the SYSTEM CONTROL button as a "one-touch" button for a single operation rather than executing a series of commands.

Note
Some specific remote control signals may not be learned. Refer to the operating instructions supplied to the specific remote control as well.

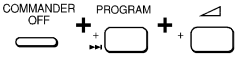


Example: To store the On/Off signal of an air-conditioner to the SYSTEM CONTROL 2 button

1 Place the Commander head to head with the remote control of the air-conditioner.



2 While pressing COMMANDER OFF, press PROGRAM + and ◿ +.

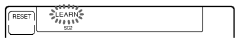


"LEARN" appears and the display that stands for the learnable SYSTEM CONTROL buttons flashes in the display panel.

If a signal has been learned on that button, the display stays lit. If you want to programme on that button, clear the signal first (page 40).

3 Press the SYSTEM CONTROL button you want to teach.

"LEARN" flashes and the display for the pressed SYSTEM CONTROL button stays lit.



4 Press and hold down the button of the remote control until you hear a beep.
(If you release the button before you hear a beep, the signal may not be learned correctly.)

"LEARN" display stops flashing and stays lit.

If "NG" flashes on the display
Learning did not succeed. Try Steps 3 and 4 again.

5 Press COMMANDER OFF.

Continued

Note

You can programme a remote control signal for a SYSTEM CONTROL button by "learning" for which the System Control functions have been programmed. In this case, the System Control functions are overwritten and cannot be used. If you clear the "learned" signal from the button, the System Control function, are restored, and you can use them again.

To clear the learned remote control signal

1 While pressing COMMANDER OFF, press PROGRAM + and ◿ +.
2 While pressing the RESET key, press the SYSTEM CONTROL button (1, 2, or 3).
3 Press COMMANDER OFF.

The display for that button flashes.

If you want to programme a new signal for that button, follow Steps 3 to 5.

Notes on learning the signals of an air-conditioner

About seasonal adjustments

If you change the settings of the air-conditioner for the season, you have to programme the remote control signals of the new settings on the Commander.

If the power-on/off operation does not work correctly

The air-conditioner may not be turned on or off properly with the button of this Commander, for which you have programmed its power-on/off signal. If the Commander can operate only "ON" with one button and "OFF" with another, while your air-conditioner's remote control can operate "ON/OFF" with a single button, programme the signal on two buttons of the Commander as follows.

1 Clear the learned power-on/off signal. (In the example on page 39, clear the learned signal from the SYSTEM CONTROL 2 button.)
2 Programme the signal (transmitted from the power-on/off button of the air-conditioner's remote control) for the SYSTEM CONTROL 2 button again.
3 Programme the signal from the same button of the remote control for another button (for example, the SYSTEM CONTROL 3 button).

The two buttons of the Commander have been programmed with the power-on signal and the power-off signal of the air-conditioner, respectively so that you can operate the air-conditioner with the Commander.

Transferring Data between Remote Commanders

You can transfer data, such as learned signals and component code settings, between this Commander and another Sony RM-AV2100T or a Sony RM-VL900T remote commander.

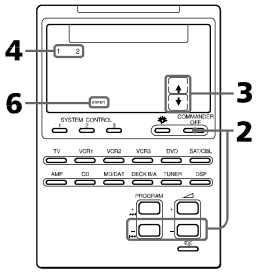
Note on remote commanders

Data can be transferred between this commander and another Sony RM-AV2100T or RM-VL900T remote commander. You cannot transfer data between this commander and the commander other than Sony RM-AV2100T and RM-VL900T.

Transferring data

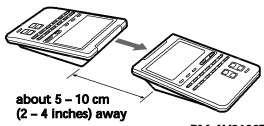
You can transfer the all data of this Commander or the data of a Component Select button on this Commander to another Sony RM-AV2100T or RM-VL900T.

To transfer the all data of the Commander

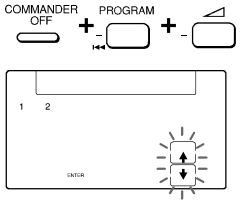


1 Place the RM-AV2100T head to head with another remote commander.

Another remote commander



2 While pressing COMMANDER OFF, press PROGRAM – and ◿ –.



3 Press the ↑ key.

↑: Transfer data
↓: Receive data

Continued

4 Press the 1 key.

1: All data of the Commander
2: Data of a Component Select button

5 Confirm that the receiving remote commander is ready for data.
(To set the receiving commander, follow the procedure on page 43.)

6 Press the "ENTER" key.

As the data is transferred, the corresponding component name goes off. If the all data has been successfully transferred, the backlight of the display turns off.

Note

If "NG" appears while sending the data, go back to Step 5 and continue the operation or press COMMANDER OFF to stop the operation.

Note

Be sure that the receiving remote commander is ready to receive data.

To transfer the data of a Component Select button

The data of a Component Select button on this Commander (the settings and learned signals programmed on the keys and buttons) can be transferred to a Component Select button on another Sony RM-AV2100T or RM-VL900T.

1-3 Perform Steps 1 to 3 on page 41.

4 Press the 2 key.

5 Press the Component Select button whose data you want to send.

6 Confirm that the receiving remote commander is ready to accept data.
(To set the receiving commander, follow the procedure on page 43.)

7 Press the "ENTER" key.

When the data has been transferred, "TV" and "↑" go off. If the data have been successfully transferred, the backlight of the display turns off.

Note

If "NG" appears while sending the data, go back to Step 6 and continue the operation or press COMMANDER OFF to stop the operation.

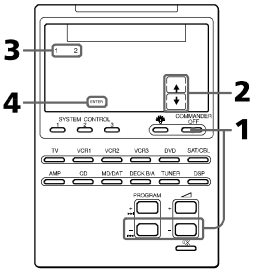
Notes

- The data of the "learned" signal and the System Control function programmed for a Component Select button cannot be transferred.
  You can use the learning function (page 32) to programme the "learned" signal and the System Control functions programmed for a Component Select button on another remote commander.
- Be sure that the receiving remote commander is ready to receive data.

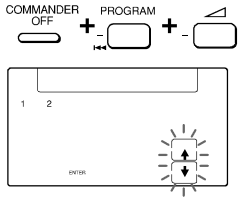
Receiving the data

This Commander can receive the data of another Sony RM-AV2100T or RM-VL900T.

To receive the all data from another remote commander



1 While pressing COMMANDER OFF, press PROGRAM + and ◿ –.



Continued

Transferring Data between Remote Commanders (continued)

2 Press the ↓ key.

↑: Transfer data
↓: Receive data

3 Press the 1 key.

1: All data of the Commander
2: Data of a Component Select button

4 Press the ENTER key.

As the data is received, the corresponding component name stays lit. If the all data have been successfully received, the backlight of the display turns off.

Notes

- If the Commander is not ready for receiving the data, press CLEAR key, then EXECUTE key to clear the learned signal on all or one of the Component Select buttons.
- If "NG" appears during data transfer, go back to Step 3 and continue the operation or press COMMANDER OFF to stop the operation. If you continue the operation, you have to set the sending remote commander again to send data.

To receive the data of a Component Select button from another remote commander

1-2 Perform Steps 1 and 2 on pages 43 and 44.

3 Press the 2 key.

4 Press the Component Select button to which want to assign the data.

5 Press the ENTER key.

When the data have been received, "TV" and "↓" go off. If the data have been successfully received, the backlight of the display turns off.

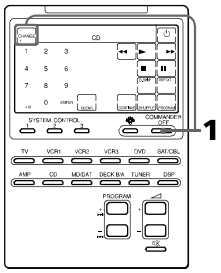
Notes

- If the Commander is not ready for receiving the data, press CLEAR key, then EXECUTE key to clear the learned signal on all or one of the Component Select buttons.
- If "NG" appears during data transfer, go back to Step 3 and continue the operation or press COMMANDER OFF to stop the operation. If you continue the operation, you have to set the sending remote commander again to send data.

Locking the Controls

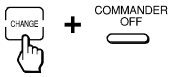
— Hold Function

To prevent accidental operation, you can lock all the buttons with the Hold function.



If the CHANGE key is not displayed, press any button (except the SYSTEM CONTROL or COMMANDER OFF buttons) before you start.

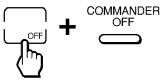
1 While pressing the CHANGE key, press COMMANDER OFF.



"OFF" is displayed.

To unlock the control

While pressing the OFF key, press COMMANDER OFF.

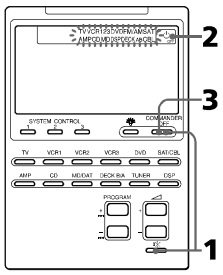


"OFF" disappears from the display.

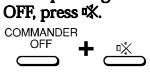
Protecting your settings

— Preset Lock Function

You can lock the Commander so that you can not change, add, or clear any of your component code settings (page 8).



1 While pressing COMMANDER OFF, press ⊿.



All the component names flash and "⏻ OFF" appears.

2 Press the ⏻ OFF key.

All the component names stop flashing and stay lit, and "⏻ ON" flashes.

3 Press COMMANDER OFF.

When the preset lock is on

If you try to set a component code number (page 8) or perform learning for the Component Select buttons (page 32), "NG" will flash on the display.

To unlock the preset lock

To unlock the preset lock, follow the same procedure as the above and press the ⏻ ON key in Step 2. "⏻ OFF" appears on the display.

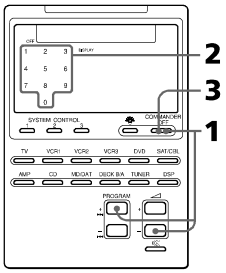
Changing the Auto Power-Off Time of the Commander

The Commander is preset at the factory to switch the power off automatically after 10 minutes if left unused (Auto Power-Off). To change this time, perform the following procedure.

You can set the Auto Power-Off time up to 90 minutes, in units of 10 minutes, or disable the Auto Power-Off function.

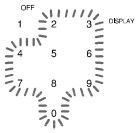
Note

The Auto Power-Off function only turns off the power of the Commander, but not of the component.



1 While pressing COMMANDER OFF, press PROGRAM + and ⊿ –.

The number which shows the current Power-Off time of the Commander stays lit, and other numbers flash.



2 Press one of the 1 – 9 keys to select the Auto Power-Off time, or press the 0 key to disable the Auto Power-off function.

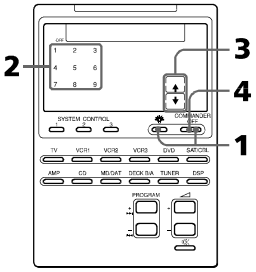
For example, to set the Auto Power-Off time to 20 minutes, press the 2 key.

"2" stops flashing and stays lit.

3 Press COMMANDER OFF.

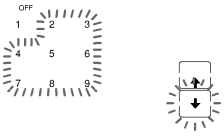
Adjusting the Backlight of the Display Window

The Commander is preset at the factory to bright backlight, and to switch off the backlight automatically after 10 seconds. To change this setting, perform the following procedure.
You can adjust the backlight Automatic-Off time (from 10 seconds to 90 seconds in the units of 10 seconds) and the brightness (bright or dim).



1 While pressing COMMANDER OFF, press ☼.

The number which shows current Automatic-Off time and the arrow indicating the current brightness of the backlight stay lit. Other numbers and the opposite arrow will flash.



2 Press one of the 1 – 9 keys to select the Off time.
For example, to set the Automatic-Off time to 20 seconds, press the 2 key.

"2 " stops flashing and stays lit.

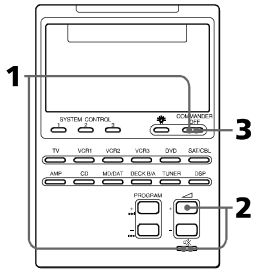
3 Press the ↑ or ↓ key, to select the brightness.
To brighten, press ↑, to dim, press ↓.

The chosen arrow stays lit.

4 Press COMMANDER OFF.

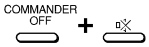
Setting the Key-Touch Beep

You can turn on or off the key-touch confirmation beep.

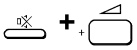


To turn on the key-touch beep

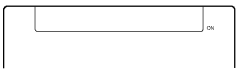
1 While pressing COMMANDER OFF, press 🔇.



2 While pressing 🔇, press ◿ +.



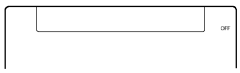
"ON" appears on the display.



3 Press COMMANDER OFF.

To turn off the key-touch beep

In Step 2, while pressing 🔇, press ◿ –.
"OFF" appears on the display.



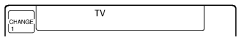
Changing the Touch-Key Display

Each Component Select button has two types of touch-key displays: the full-function display and the basic-function display. On the basic-function display, only the keys that are used for basic operations are displayed.
You can modify the basic-function display by setting only the desired keys on it (See "To display only the desired keys.").

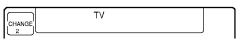
To change the display type

1 Press the CHANGE key for any Component Select key.
Each time you press the CHANGE key, the display type changes.

"CHANGE 1" appears when the full-function display is selected.



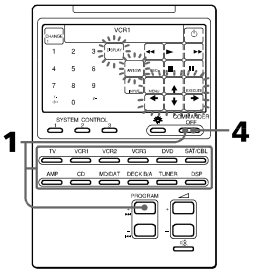
"CHANGE 2" appears when the basic-function display is selected.



Notes

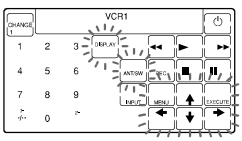
- You can select only one of the display types for all Component Select buttons.
  If you change the display type to the basic-function ("CHANGE 2") display for a Component Select button, the displays for all other Component Select buttons are also changed to the same type ("CHANGE 2").
- The number of keys displayed on the full-function display varies according to the component codes preset for the Component Select buttons. For components that have few keys in the full-function display, the basic-function display can be the same as the full one. In this case, you cannot modify the basic-function display (See "To display only the desired keys.").
- A key that has learned any signal is always displayed both in the full- and basic-function displays.

To display only the desired keys



You can set only the desired keys on the basic-function display. It makes operations easier, because only the keys you will use are displayed.

1 While pressing COMMANDER OFF, press PROGRAM + and the Component Select button whose display you want to modify.



2 Press the key you want to display.

Each time the key is pressed, it is selected and deleted alternately.
A selected key stops flashing and stays lit.

3 Repeat Step 2 until all necessary keys are set.

4 Press COMMANDER OFF.

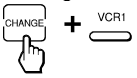
Note

For components that have few keys on the full-function display, the basic-function display can be the same as the full one. In this case, you cannot modify the basic-function display.

To clear the settings on the basic-function display

1 While pressing COMMANDER OFF, press PROGRAM + and a Component Select button.

2 While pressing the CHANGE key, press the Component Select button again.



3 Press COMMANDER OFF.

Note

If you clear the settings on the basic-function display using the procedure above, the display returns to its original key settings. It doesn't clear the learned signals from keys.

Appendix

Table of Preset Functions

Note
There may be some components or functions that cannot be operated with this Commander.

TV

KEY DISPLAY	FUNCTION
⏻	To turn the power on/off
1 – 9, 0	To change the programme Also to turn on
1-, -/- -	To select doble-digit numbers. Works in the same way as the TV's commander.
2-	To select a number between 20 and 29
RED, GREEN, YELLOW, BLUE	Fastext buttons
TELETEXT	To switch to teletext
TV	To turn on. To return from teletext to TV.
INPUT	To change the input mode
16:9	To switch to WIDE
MENU	To call up the MENU display
↑	To move the cursor upward
↓	To move the cursor downward
→	To move the cursor to the right
←	To move the cursor to the left
EXECUTE	To enter the selection of the MENU display
PIP ON/OFF	To turn on/off the "window" picture
PIP CH +/–	To change the TV programme in the "window" picture
PIP MOVE	To move the location of the "window" picture
PIP SWAP	To swap the "main" picture and the "window" picture
PROGRAM +/–	Programme up: + Programme down: –
RECALL	To operate JUMP function on the TV depending on the setting of the TV's manufacturer
◿ +/–	Volume up: + Volume down: –
🔇	To mute the volume on the TV. Press again to turn muting off.

Using Fastext

With Fastext you can access pages with one key stroke. When a Fastext page is broadcast, a colour-coded menu will appear at the bottom of the screen. The colours of this menu correspond to the red, green, yellow and blue keys on the Remote Commander.
Press the key which corresponds to the colour-coded menu. The page will be displayed after some seconds.

VCR 1, 2, 3

KEY DISPLAY	FUNCTION
⏻	To turn the power on/off
1 – 9, 0	To change the programme Also to turn on
1-, -/- -	To select doble-digit numbers. Works in the same way as the TV's commander.
2-	To select a number between 20 and 29
INPUT	To change the input mode
DISPLAY	To activate the on-screen display
ANT/SW	To switch the aerial output
MENU	To call the MENU display
↑	To move the cursor upward
↓	To move the cursor downward
→	To move the cursor to the right
←	To move the cursor to the left
EXECUTE	To enter the selection of the MENU display
◀◀	To rewind
▶	To play
▶▶	To fast-forward
REC	To record, press ▶ while pressing REC.* First release ▶, then release REC.
■	To stop
❚❚	To pause
PROGRAM +/–	Programme up: + Programme down: –

* In order to avoid recording by mistake, the REC key does not work by itself. You can assign this operation (record) to a single key using the learning function (page 16).

DVD

KEY DISPLAY	FUNCTION
⏻	To turn to the power on and off
1 – 9, 0	Number buttons: To set items selected from the screen
+10	To select numbers 10 and above
ENTER	To enter a setting or to set items selected from the screen
AUDIO	To change the sound
DISPLAY	To show the current play status on the screen
ANGLE	To switch angle
CLEAR	To clear the selected characters from the screen
RETURN	To return to the last previous screen
TITLE	To display the title menu
SUB TITLE	To switch the subtitle
DVD MENU	To display the DVD menu
↑	To move the cursor upward
↓	To move the cursor downward
→	To move the cursor to the right
←	To move the cursor to the left
EXECUTE	To execute items selected from the screen
◀◀	To rewind
▶	To play
▶▶	To fast-forward
■	To stop
❚❚	To pause
▶▶|	To proceed to the next location or song
|◀◀	To proceed to the previous location or song

Continued

Table of Preset Functions (continued)

VD (Video disc player)

KEY DISPLAY	FUNCTION
⏻	To turn the power on/off
1 – 9, 0	To select the track number (0 selects track 10) To select track numbers above 10, see the descriptions on the +10 button below
+10	To select numbers 10 and above
ENTER	To enter the setting
DISPLAY	To show the current play status on the screen
CLEAR	To clear the selected characters from the screen
A	To select disc side A
B	To select disc side B
◀◀	To rewind
▶	To play
▶▶	To fast-forward
■	To stop
❚❚	To pause
▶▶|	To proceed to the next location or song
|◀◀	To proceed to the previous location or song

CBL (Cable box)

KEY DISPLAY	FUNCTION
⏻	To turn the power on/off
1 – 9, 0, ENTER	To change the programme For example, to change to programme 5, press 0 and 5 (or , press 5 and ENTER)
PROGRAM +/–	Programme up:+ Programme down: –
RECALL	To operate JUMP, FLASHBACK or CHANNEL RETURN function

SAT (Satellite tuner)

KEY DISPLAY	FUNCTION
⏻	To turn the power on/off
1 – 9, 0	To change the programme Also to turn on
1-, -/- -	To select double-digit numbers.
RED, GREEN, YELLOW, BLUE	Fastext buttons
TELETEXT	To switch to teletext
INPUT	To switch the output of the SAT receiver to the TV (When you connect a TV cable or anntenna to the receiver, the output switches between a TV and SAT programme)
EPG	To show or hide the EPG display
GUIDE	To bring up Master Guide
EXIT	To exit the mode
MENU	To call up the MENU display
↑	To move the cursor upward
↓	To move the cursor downward
→	To move the cursor to the right
←	To move the cursor to the left
EXECUTE	To bring up the Station Index when a programme guide is not displayed To select the programme that is highlighted
PROGRAM +/–	Programme up: + Programme down: –
RECALL	To return to the last tuned station

AMP (Amplifier)

KEY DISPLAY	FUNCTION
⏻	To turn the power on/off
1 - 9, 0	To use the key directly
ENTER	To enter the setting
VIDEO 1	To select the input source: VIDEO 1
VIDEO 2	To select the input source: VIDEO 2
VIDEO 3	To select the input source: VIDEO 3
AUX/VDP	To select the input source: VDP (LD)
DVD	To select the input source: DVD
TV	To select the input source: TV
CD	To select the input source: CD
MD/DAT	To select the input source: MD
FM/AM	To select the input source: FM/AM
TAPE	To select the input source: TAPE
PHONO	To select the input source: PHONO
MENU	To call up the MENU display
↑	To move the cursor upward
←	To move the cursor to the left
→	To move the cursor to the right
↓	To move the cursor downward
EXECUTE	To enter the selection of the MENU display

Continued

Table of Preset Functions (continued)

KEY DISPLAY	FUNCTION
SHIFT	To shift band or preset select
PROGRAM +/–	Presetting or tuning frequency to a higher: +
	Presetting or tuning frequency to a lower: –
◿ +/–	Volume up: +
	Volume down: –
🔇	To mute the volume on the AMP Press again to turn muting off.

CD

KEY DISPLAY	FUNCTION
⏻	To turn the power on/off
1 – 9, 0	To select the track number (0 selects track 10) To select track numbers above 10, see the descriptions on the +10 button below.
+10	To select numbers 10 and above
ENTER	To enter the setting
D.SKIP	To select next disk
REPEAT	To select repeat play mode
CONTINUE	To select continuous play mode
SHUFFLE	To play in random order
PROGRAM	To use for programme play
CLEAR	To clear the setting
◀◀	To rewind
►	To play
▶▶	To fast-forward
■	To stop
▮▮	To pause
▶▶|	To select the next track
|◀◀	To select the previous track

MD

KEY DISPLAY	FUNCTION
⏻	To turn the power on/off
1 – 9, 0	To select the track number (0 selects track 10) To select track numbers above 10, see the descriptions on the +10 button below.
+10	To select numbers 10 and above
ENTER	To enter the setting.
D.SKIP	To select the next disc
DISPLAY	To switch the display mode
CONTINUE	To select continuous play mode
SHUFFLE	To play in random order
PROGRAM	To use for programme play
CLEAR	To clear the setting
◀◀	To rewind
►	To play
▶▶	To fast-forward
REC	To record, press ► while pressing REC.* First release ►, then release REC.
■	To stop
▮▮	To pause
▶▶|	To select the next track
|◀◀	To select the previous track

* In order to avoid recording by mistake, the REC key does not work by itself. You can assign this operation (record) to a single key using the learning function (page 16).

DAT

KEY DISPLAY	FUNCTION
⏻	To turn the power on/off
1 – 9, 0	To select a programme number
ENTER	To enter the setting
DISPLAY	To switch the display mode
◀◀	To rewind
►	To play
▶▶	To fast-forward
REC	To record, press ► while pressing REC.* First release ►, then release REC.
■	To stop
▮▮	To pause
○	Record muting
▶▶|	To proceed to the next song
|◀◀	To proceed to the previous song

* In order to avoid recording by mistake, the REC key does not work by itself. You can assign this operation (record) to a single key using the learning function (page 16).

Continued

Table of Preset Functions (continued)

DECK B/A (Tape deck)

KEY DISPLAY	FUNCTION
⏻	To turn the power on/off
◀◀	To rewind
◄	To reverse
►	To play
▶▶	To fast-forward
REC	To record, press ► while pressing REC.* First release ►, then release REC.
■	To stop
▮▮	To pause
○	Record muting
A/B	To select the tape deck: Deck A or B (dual cassette deck only)

* In order to avoid recording by mistake, the REC key does not work by itself. You can assign this operation (record) to a single key using the learning function (page 16).

FM/AM (TUNER) (FM/AM tuner)

KEY DISPLAY	FUNCTION
⏻	To turn the power on/off
1 – 9, 0	Number buttons
+10	To select numbers 10 and above
ENTER	To enter the setting
BAND	To select FM/AM
►	Tuning up
◄	Tuning down
SHIFT	To shift bands or preset select
A	To select the page group A of preset
B	To select the page group B of preset
C	To select the page group C of preset
PROGRAM +/–	Presetting or tuning to a higher frequency: +
	Presetting or tuning to a lower frequency: –

DSP (Digital Surround Processor)

KEY DISPLAY	FUNCTION
⏻	To turn the power on/off
T.TONE	To make a test tone
SOUND FIELD	To turn on/off the sound fields
GENRE	To select a sound field genre
MODE	To select a sound field mode
►	Input select ›
◄	Input select ‹
MENU	To call up the MENU display
↑	Digital processing control ^
↓	Digital processing control ˇ
→	Digital processing control ›
←	Digital processing control ‹
CENTER ◇	To adjust the centre speaker level
REAR ◇	To adjust the rear speaker level
SUB WOOFER ◇	To adjust the subwoofer level
EFFECT ◇	To control the effect
FRONT BAL ◇	To control the front speaker balance
REAR BAL ◇	To control the rear speaker balance

Quick Reference of Operations

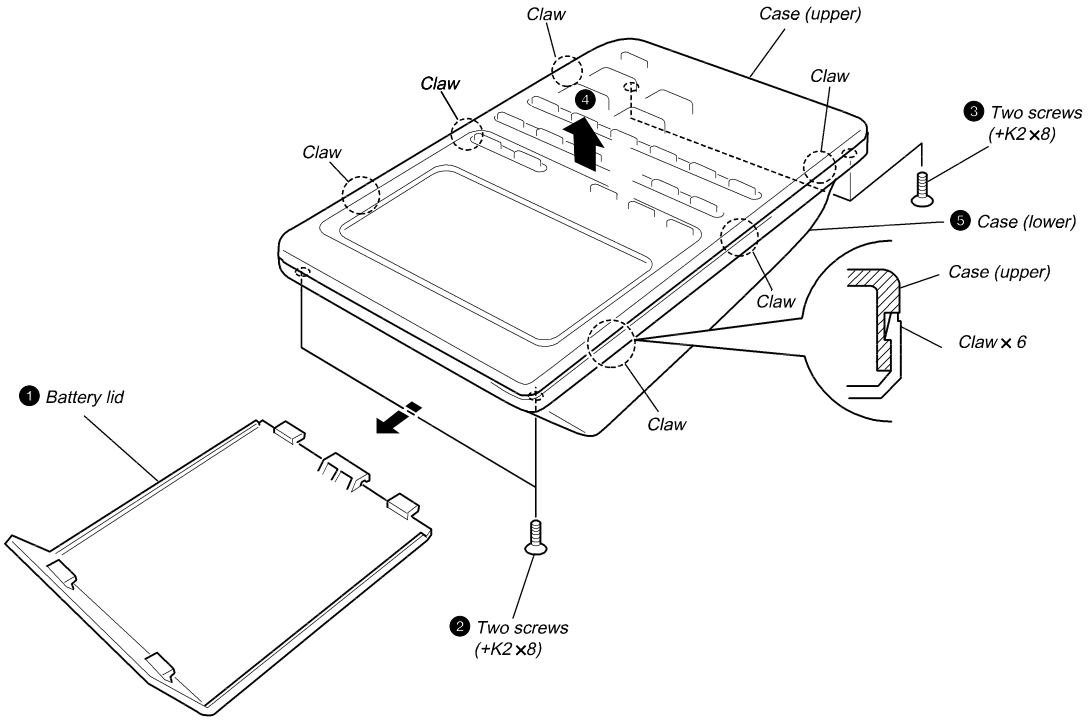
To	Press	For details, see
Set a component code	COMMANDER OFF + 🔇	page 8
Program to the keys or buttons on a component (learning function)	COMMANDER OFF + Component Select	page 16
Assign other components to the Component Select buttons	COMMANDER OFF + PROGRAM – + Component Select	page 35
Change the volume control setting	COMMANDER OFF + ◿ + + ◿ –	page 22
Assign the System Control function to the SYSTEM CONTROL buttons	COMMANDER OFF + SYSTEM CONTROL (1, 2, 3)	page 24
Set the System Power-Off function	COMMANDER OFF + PROGRAM – + ◿ +	page 34
Program the Power-on command to the Component Select buttons	COMMANDER OFF + ◿ – + Component Select	page 31
Program a command to the SYSTEM CONTROL buttons or Component Select buttons	COMMANDER OFF + PROGRAM + + ◿ +	page 32, 38
Copy the settings of one Component Select button to another	COMMANDER OFF + (copy to) Component Select ↓ (copy to) Component Select + (copy from) Component Select	page 37

To	Press	For details, see
Program a System Control functions for Component Select buttons	COMMANDER OFF + ◿ + + Component Select	page 28
Set the desired keys on the display	COMMANDER OFF + PROGRAM + + Component Select	page 50
Set the interval of the System Control functions	COMMANDER OFF + PROGRAM + + PROGRAM –	page 30
Transfer data	COMMANDER OFF + ◿ – + PROGRAM –	page 41
Turn the key-touch beep on/off	COMMANDER OFF + 🔇 ↓ (ON) 🔇 + ◿ + (OFF) 🔇 + ◿ –	page 49
Set the Auto Power-Off time	COMMANDER OFF + PROGRAM + + ◿ –	page 47
Set the Auto-Off time/ brightness of the Backlight	COMMANDER OFF + ☀	page 48
Lock the Remote Commander	CHANGE + COMMANDER OFF	page 45

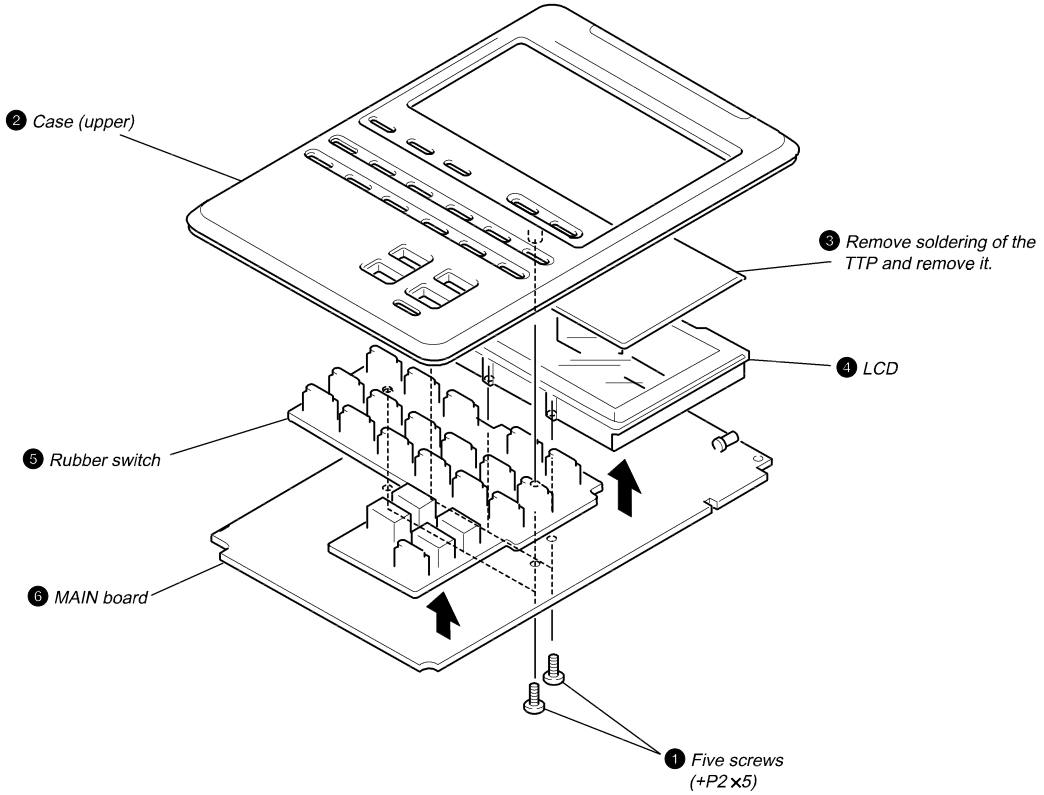
SECTION 2
DISASSEMBLY

Note: Follow the disassembly procedure in the numerical order given.

2-1. CASE (LOWER)



2-2. MAIN BOARD



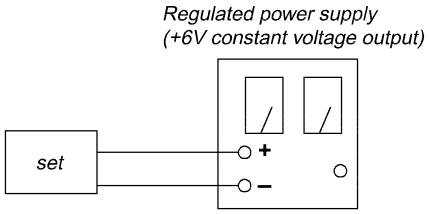
SECTION 3
TEST MODE

TEST Mode (Operation Check)

Preform the following operation checks using the TEST Mode before starting the repair works.

1. All Keys Operation Check

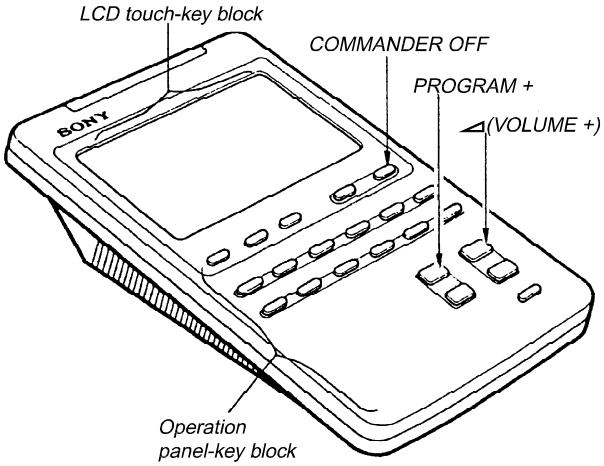
Connection Method :



1) While pressing the PROGRAM + key and the ◿ (VOLUME +) key, ture ON the main power of the regulated power supply (DC +6V). (Refer to Fig. 1-1.)
2) After sounding buzzer, remove all hands from pressing the all keys descrived in above step 1). The all indications of the LCD must be turned OFF. (Refer to Fig. 1-2.)
3) When any key of the Operation panel-key block (except the COMMANDER OFF key), or any key of the LCD touch-key block is pressed, the signal (carrier 40kHz) as shown in Fig. 1-3 must be transmitted in accordance the pressed key, when operation of the machine is normal.
4) Press all keys of the Operation panel-key block (except the COMMANDER OFF key, and of the LCD touch-key block sequentially. When all keys are pressed, confirm that the long buzzar sound and aii LCD displays are turned off.

NOTE : Be careful that all data in S-RAM is cleared when the above TEST mode is performed.

- This TEST Mode can be terminoted in its middle before testing all keys by pressing the COMMANDER OFF key. However the conduction check of the remairing keys cannot be checked. (S-RAM isnot cleared.)
- P-ROM (IC9) is diagnosed to be free from defects when the steps from 1) to 4) are performed correctly.



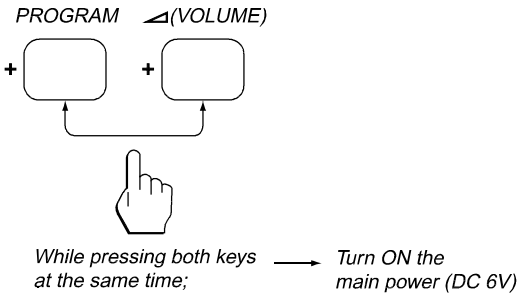


Fig. 1-1

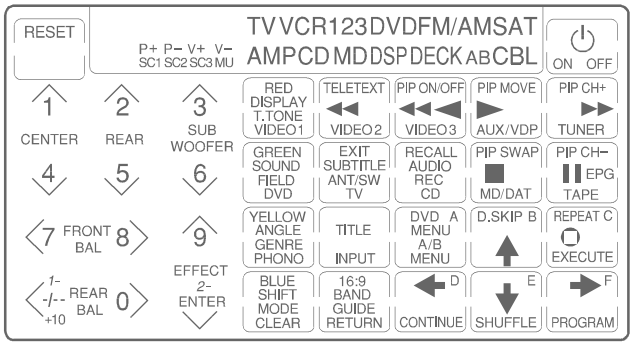


Fig. 1-2

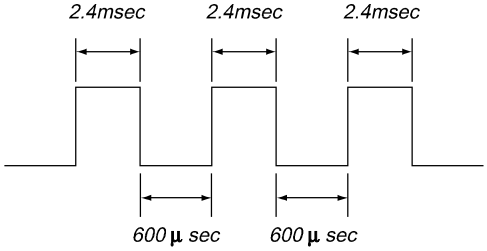
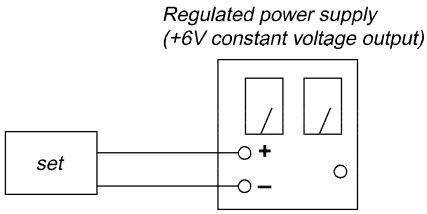


Fig. 1-3

2. S-RAM (Learning Function) Operation Check

Connection Method :



1) While pressing the ⊿ (VOLUME –) key and the PROGRAM– key, ture ON the main power of the regulated power supply (DC +6V). (Refer to Fig. 2-1.)
2) When LEARN and 4 of the LCD display appear, remove hands from pressing the above mentioned keys. (Refer to Fig. 2-2.)
3) The display appears when the S-RAM is not defective. (The diaplay NG appears when the S-RAM is defective.) (Refer to Fig. 2-2.)
4) The display status as descrived in step 3) continues until any key is pressed.

- S-RAM (IC3) is diagnosed to be free from defects when the above steps from 1) to 4) are performed correctly.

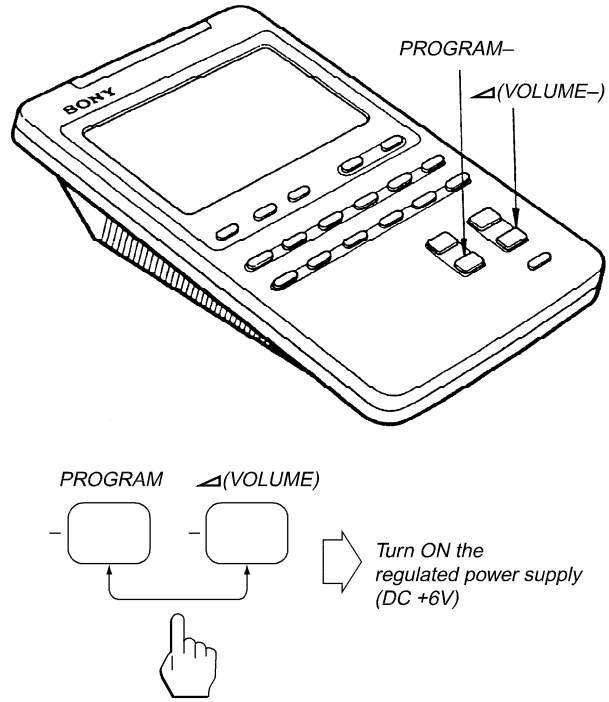


Fig. 2-1

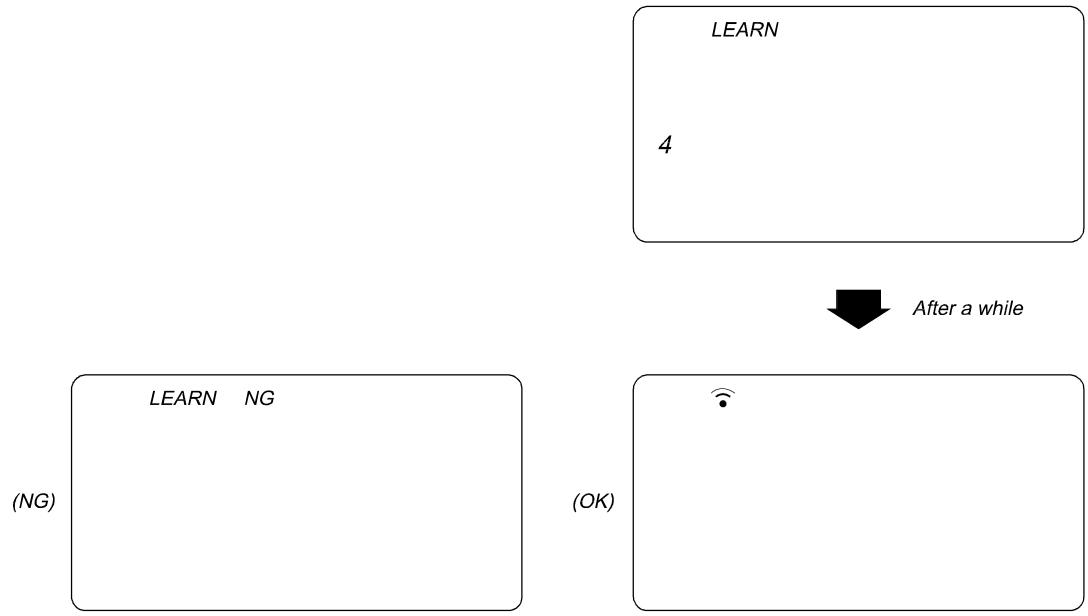


Fig. 2-2

SECTION 4
DIAGRAMS

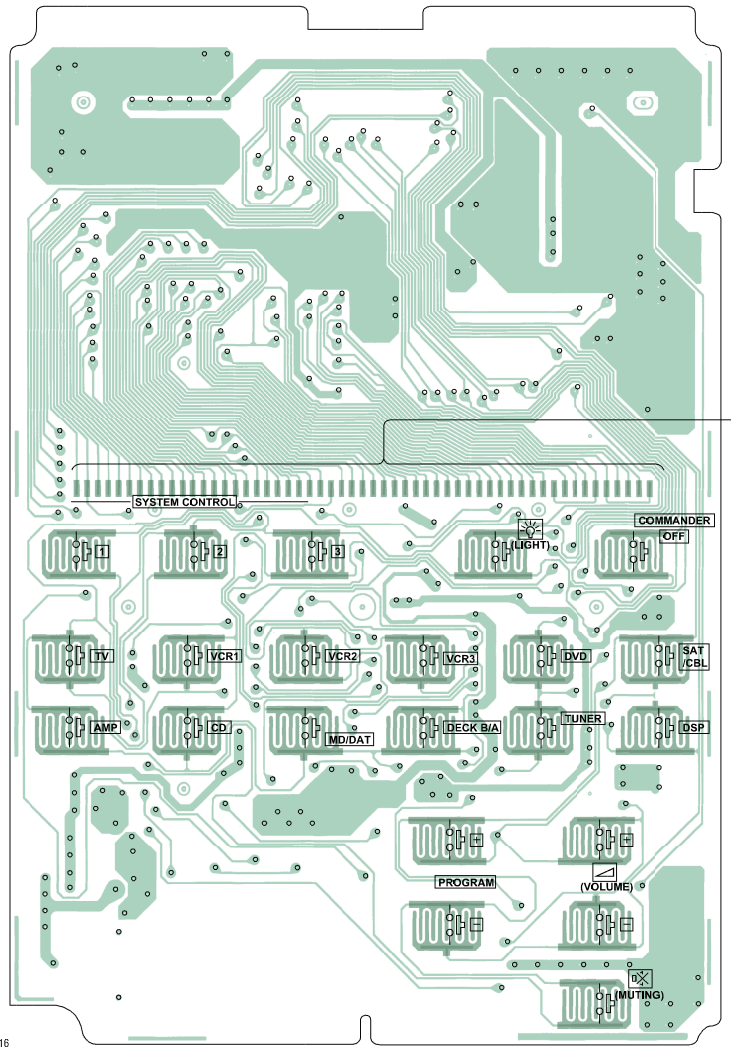
4-1. IC PIN FUNCTION

• IC1 (μPD780308) (SYSTEM CONTROL)

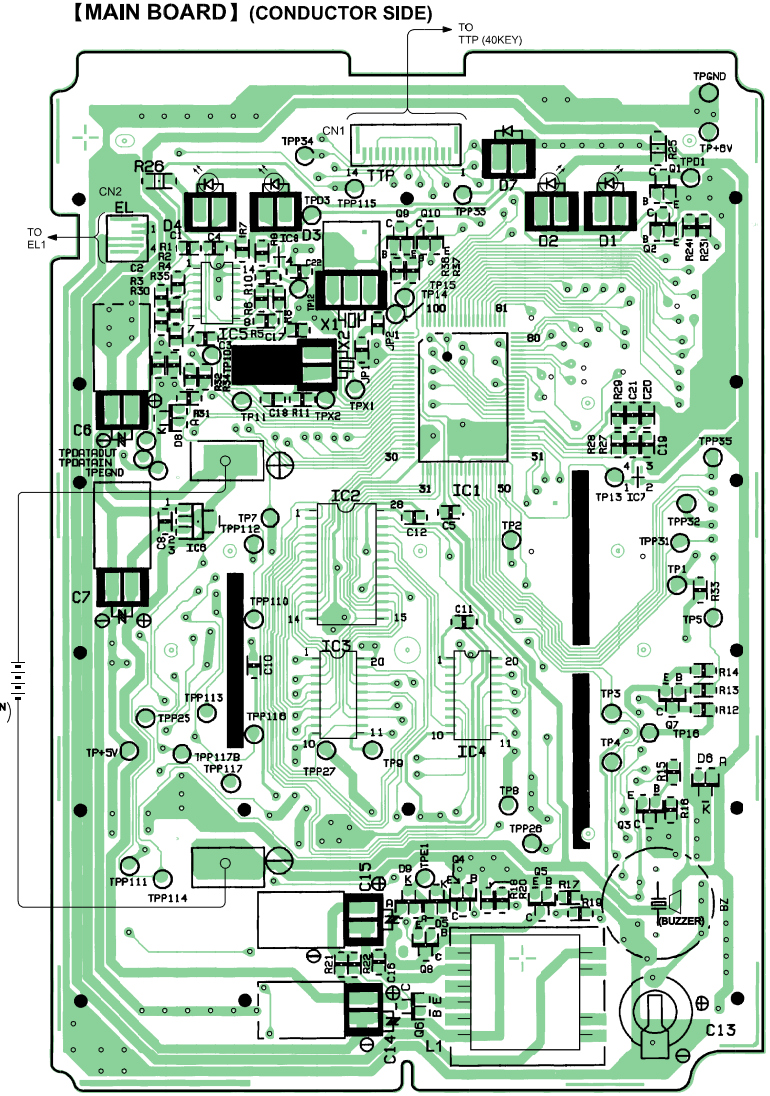
Pin No.	Pin Name	I/O	Pin Description
1,2	P26,27	O	Segment signal output terminal.
3	P70	I	Serial input.
4	P71	O	Serial output.
5	P72	I	Asynchronous serial clock.
6	VPP	–	Internally connected.
7	X2	O	Crystal.(Main system clock)
8	X1	I	Crystal.(Main system clock)
9	VDD	–	Power supply.
10	XT1	I	Crystal.(Subsystem clock)
11	XT2	O	Crystal.(Subsystem clock)
12	RESET	I	Reset.
13,14	P00,01	I	Remote control signal received input.
15	P02	O	Remote control signal received block ON/OFF output.
16 to 18	P03 to P05	O	Terminals to white external memory is connected.
19 to 26	P110 to P117	I	Segment signal input terminal.
27	AVSS	–	Ananog ground.
28 to 35	P10 to P17	I/O	Analog data input.
36	VDD	–	Power supply.
37	AVREF	I	Analog reference voltage.
38	P100	O	EL control output.(bright)
39	P101	O	EL control output.(dark)
40	VSS	–	Ground.
41	P102	O	Latch. (upper bits)
42	P103	I	Power supply termina.
43	P30	O	Remote control signal received output.
44 to 48	P31 to P35	O	Segment signal output terminal.
49	P36	O	Buzzer clock.
50	P37	O	Latch. (lower bits)
51 to 54	COM0 to COM3	O	Common clock.
55	BIAS	–	LCD power supply bias contorl.
56 to 58	VLC0-2	–	LCD power supply.
59	VSS	–	Ground.
60 to 83	S0 to S23	O	Segment signal output terminal.
84 to 99	S24 to S39	I/O	Segment signal input/output terminal.
100	P25	O	Segment signal output terminal.

4-2. PRINTED WIRING BOARD — MAIN SECTION —

【MAIN BOARD】(COMPONENT SIDE)



【MAIN BOARD】(CONDUCTOR SIDE)

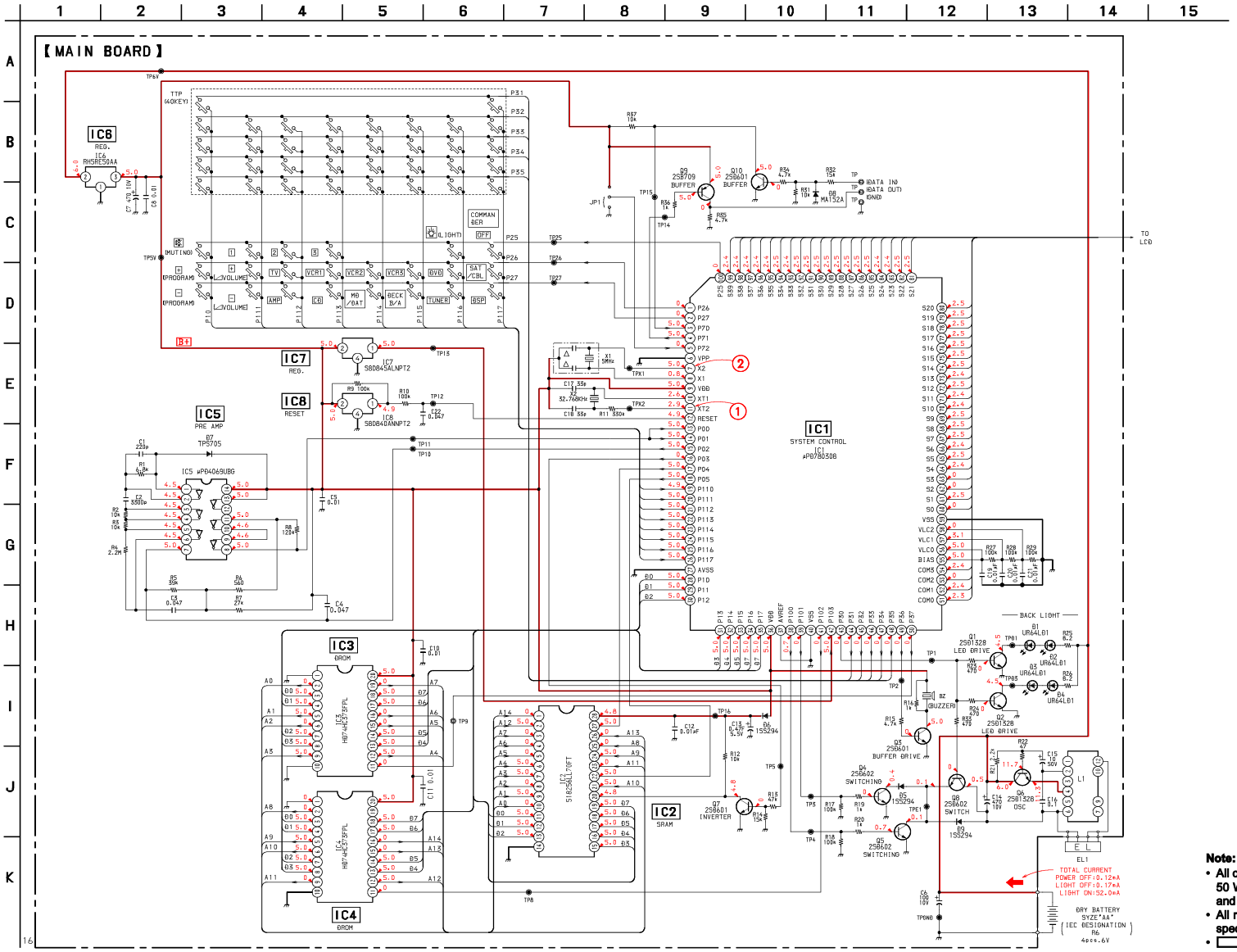


• **Semiconductor Location**

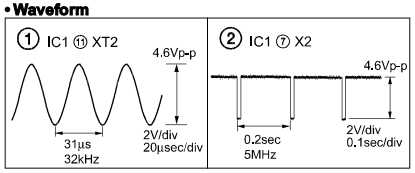
Ref. No.	Location
D1	B-10
D2	B-9
D3	B-7
D4	B-7
D5	F-8
D6	E-10
D7	B-9
D8	C-8
D9	F-8
IC1	C-9
IC2	D-8
IC3	E-8
IC4	E-9
IC5	B-7
IC6	D-7
IC7	D-10
IC8	B-7
Q1	B-10
Q2	B-10
Q3	F-10
Q4	F-9
Q5	F-9
Q6	G-8
Q7	E-10
Q8	F-8
Q9	B-8
Q10	B-8

Note:
- ⟵ : parts extracted from the component side.
- ▒▒▒ : Pattern from the side which enables seeing.

4-3. SCHEMATIC DIAGRAM — MAIN SECTION —



• Waveform



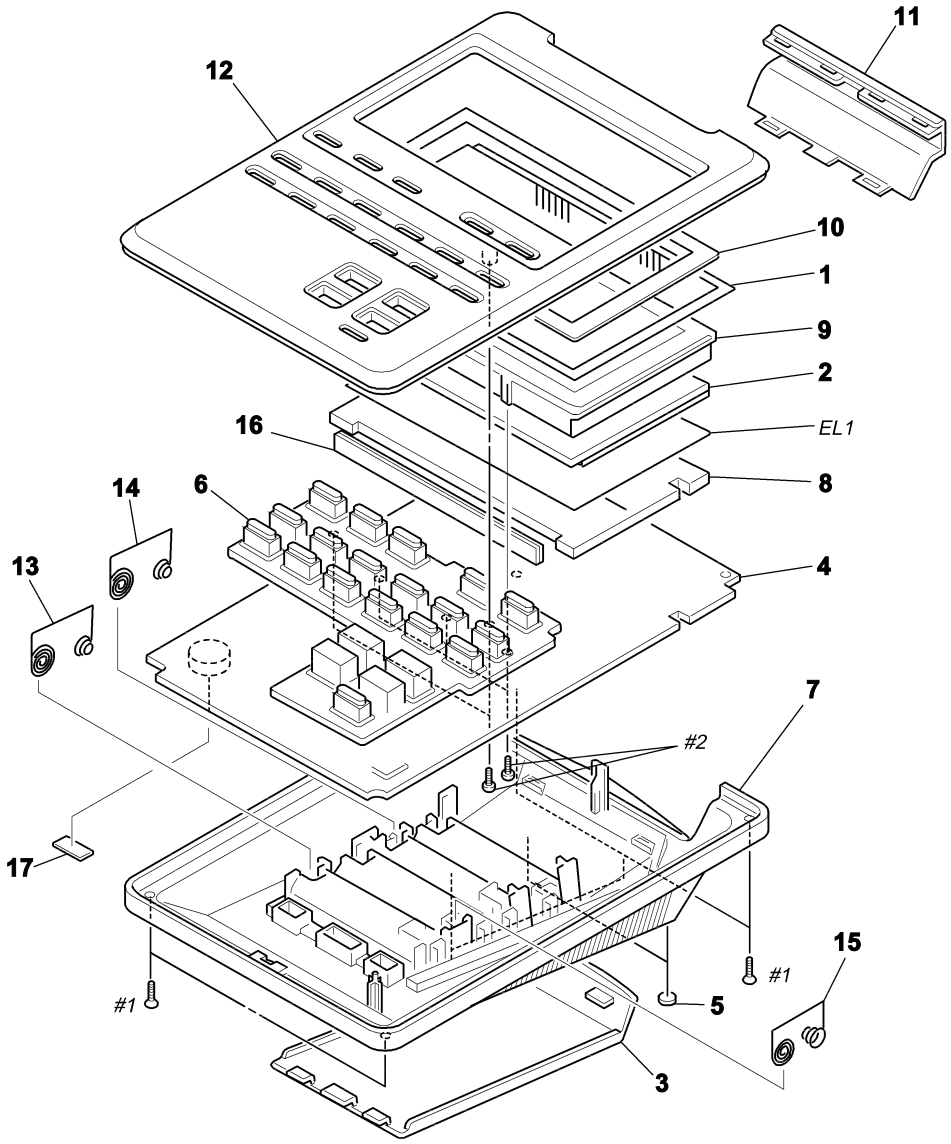
Note:

- All capacitors are in µF unless otherwise noted. pF: µµF 50 WV or less are not indicated except for electrolytics and tantalums.
- All resistors are in Ω and ¼ W or less unless otherwise specified.
- ▭ : panel designation.
- ▬ : B+ Line.
- Power voltage is dc 6V and fed with regulated dc power supply from battery terminal.
- Voltages and waveforms are dc with respect to ground under no-signal (detuned) conditions.
- Voltages and waveforms are dc with respect to ground in playback mode.
- Voltages are taken with a VOM (Input impedance 10 MΩ). Voltage variations may be noted due to normal production tolerances.
- Waveforms are taken with a oscilloscope.

SECTION 5
EXPLODED VIEW

NOTE:

- -XX, -X mean standardized parts, so they may have some differences from the original one.
- Items marked "*" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- The mechanical parts with no reference number in the exploded views are not supplied.



Ref. No.	Part No.	Description	Remarks
1	9-880-056-01	TTP	
2	9-885-007-67	LCD	
3	9-880-050-01	LID,BATTERY CASE	
* 4	9-885-007-64	MAIN BOARD, COMPLETE	
5	9-995-523-01	FOOT,RUBBER	
6	9-880-048-01	RUBBER SWITCH	
7	3-044-311-01	CASE(LOWER)	
* 8	9-880-057-01	SPACER	
* 9	9-995-525-01	LCD BRACKET	
* 10	9-880-051-01	SEAL	

Ref. No.	Part No.	Description	Remarks
11	9-995-518-01	SMOKE PLATE	
12	9-885-007-66	CASE(UPPER)	
13	9-885-005-63	COMMON TERMINAL(D)	
14	9-885-005-62	COMMON TERMINAL(C)	
15	9-885-005-64	COMMON TERMINAL(E)	
* 16	9-880-053-01	ZEBRA CONNECTOR	
17	9-880-461-01	DAMPER (SPACER LABEL)	
EL1	9-880-153-01	ELECTRO LUMINESCENT	
#1	7-685-205-19	SCREW +KTP2X4 TYPE2 NON-SLIT	
#2	7-685-103-19	SCREW +P2X5 TYPE2 NON-SLIT	

MAIN

SECTION 6
ELECTRICAL PARTS LIST

NOTE:

- Due to standardization, replacements in the parts list may be different from the parts specified in the diagrams or the components used on the set.
- -XX, -X mean standardized parts, so they may have some difference from the original one.
- Items marked "*" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- CAPACITORS:
  uF: µF
- RESISTORS
  All resistors are in ohms.
  METAL: metal-film resistor
  METAL OXIDE: Metal Oxide-film resistor
  F: nonflammable
- COILS
  uH: µH
- SEMICONDUCTORS
  In each case, u: µ, for example:
  uA...: µA... , uPA... , µPA... , uPB... , µPB... , uPC... , µPC... , uPD..., µPD...

When indicating parts by reference number, please include the board name.

Ref. No.	Part No.	Description			Remarks
*	9-885-007-64	MAIN BOARD, COMPLETE **********			
	9-885-005-73	TERMINAL (+)			
	9-885-005-74	TERMINAL (-)			
		< BUZZER >			
BZ	9-880-012-01	BUZZER			
		< CAPACITOR >			
C1	1-163-001-11	CERAMIC CHIP	220pF	10.00% 50V	
C2	1-164-182-11	CERAMIC CHIP	3300pF	10.00% 50V	
C3	1-104-760-11	CERAMIC CHIP	0.047uF	10.00% 50V	
C4	1-104-760-11	CERAMIC CHIP	0.047uF	10.00% 50V	
C5	1-104-329-11	CERAMIC CHIP	0.1uF	10.00% 50V	
C6	1-164-665-11	ELECT	100uF	20.00% 10V	
C7	1-126-925-11	ELECT	470uF	20.00% 10V	
C8	1-104-329-11	CERAMIC CHIP	0.01uF	10.00% 50V	
C10	1-104-329-11	CERAMIC CHIP	0.01uF	10.00% 50V	
C11	1-104-329-11	CERAMIC CHIP	0.01uF	10.00% 50V	
C12	1-104-329-11	CERAMIC CHIP	0.01uF	10.00% 50V	
C13	9-880-016-01	GOLD CAP	0.47F	5.5V	
C14	1-126-925-11	ELECT	470uF	20.00% 10V	
C15	1-126-964-11	ELECT	10uF	20.00% 50V	
C16	1-115-339-11	CERAMIC CHIP	0.1uF	10.00% 50V	
C17	1-163-105-00	CERAMIC CHIP	33pF	5.00% 50V	
C18	1-163-105-00	CERAMIC CHIP	33pF	5.00% 50V	
C19	1-104-329-11	CERAMIC CHIP	0.01uF	10.00% 50V	
C20	1-104-329-11	CERAMIC CHIP	0.01uF	10.00% 50V	
C21	1-104-329-11	CERAMIC CHIP	0.01uF	10.00% 50V	
C22	1-104-760-11	CERAMIC CHIP	0.047uF	10.00% 50V	
		< CONNNECTOR >			
* CN1	9-880-019-01	CONNECTOR	14P		
* CN2	9-880-018-01	CONNECTOR	4P		
		< DIODE >			
D1	9-880-014-01	LED UR64LD1 (BACK LIGHT)			
D2	9-880-014-01	LED UR64LD1 (BACK LIGHT)			
D3	9-880-014-01	LED UR64LD1 (BACK LIGHT)			
D4	9-880-014-01	LED UR64LD1 (BACK LIGHT)			
D5	8-719-820-61	DIODE 1SS294TE85R			
D6	8-719-820-61	DIODE 1SS294TE85R			
D7	9-880-013-01	DIODE TPS705WMATU2			
D8	8-719-420-26	DIODE MA152ATX			
D9	8-719-820-61	DIODE 1SS294TE85R			

Ref. No.	Part No.	Description			Remarks
		< IC >			
IC1	9-885-007-65	IC UPD780308			
IC2	9-885-005-69	IC 256KB-RAM			
IC3	8-759-305-11	IC HD74HC373FPL			
IC4	8-759-305-11	IC HD74HC373FPL			
IC5	8-759-064-38	IC UPD4069UBGE2			
IC6	8-759-512-51	IC RH5RE50AAT1			
IC7	9-885-005-72	IC S80845ALNPT2			
IC8	9-885-005-71	IC S80840ANNPT2			
		< COLI >			
* L1	9-885-005-66	EL TRANSFORMER			
		< TRANSISTOR >			
Q2	8-729-420-68	TRANSISTOR 2SD1328RTX			
Q3	8-729-421-65	TRANSISTOR 2SD601RTX			
Q4	8-729-018-55	TRANSISTOR 2SD602RTX			
Q5	8-729-018-55	TRANSISTOR 2SD602RTX			
Q6	8-729-420-68	TRANSISTOR 2SD1328RTX			
Q7	8-729-421-65	TRANSISTOR 2SD601RTX			
Q8	8-729-018-55	TRANSISTOR 2SD602RTX			
Q9	8-729-400-45	TRANSISTOR 2SB709RTX			
Q10	8-729-421-65	TRANSISTOR 2SD601RTX			
		< RESISTOR >			
R1	1-216-069-00	RES, CHIP	6.8K	5.00% 1/10W	
R2	1-216-073-00	RES, CHIP	10K	5.00% 1/10W	
R3	1-216-073-00	RES, CHIP	10K	5.00% 1/10W	
R4	1-216-129-00	RES, CHIP	2.2M	5.00% 1/10W	
R5	1-216-689-11	RES, CHIP	39K	5.00% 1/10W	
R6	1-216-043-91	RES, CHIP	560	5.00% 1/10W	
R7	1-216-083-00	RES, CHIP	27K	5.00% 1/10W	
R8	1-216-099-00	RES, CHIP	120K	5.00% 1/10W	
R9	1-216-097-91	RES, CHIP	100K	5.00% 1/10W	
R10	1-216-097-91	RES, CHIP	100K	5.00% 1/10W	
R11	1-216-109-00	RES, CHIP	330K	5.00% 1/10W	
R12	1-216-073-00	RES, CHIP	10K	5.00% 1/10W	
R13	1-216-089-91	RES, CHIP	47K	5.00% 1/10W	
R14	1-216-077-00	RES, CHIP	15K	5.00% 1/10W	
R15	1-216-065-91	RES, CHIP	4.7K	5.00% 1/10W	
R16	1-216-049-91	RES, CHIP	1K	5.00% 1/10W	
R17	1-216-097-91	RES, CHIP	100K	5.00% 1/10W	
R18	1-216-097-91	RES, CHIP	100K	5.00% 1/10W	
R19	1-216-049-91	RES, CHIP	1K	5.00% 1/10W	
R20	1-216-049-91	RES, CHIP	1K	5.00% 1/10W	

Ref. No.	Part No.	Description			Remarks
R21	1-216-057-00	RES, CHIP	2.2K	5.00%	1/10W
R22	1-216-017-91	RES, CHIP	47	5.00%	1/10W
R23	1-216-041-00	RES, CHIP	470	5.00%	1/10W
R24	1-216-041-00	RES, CHIP	470	5.00%	1/10W
R25	1-247-302-11	RES, CHIP	8.2	5.00%	1/4W
R26	1-249-458-11	RES, CHIP	8.2	5.00%	1/4W
R27	1-216-097-91	RES, CHIP	100K	5.00%	1/10W
R28	1-216-097-91	RES, CHIP	100K	5.00%	1/10W
R29	1-216-097-91	RES, CHIP	100K	5.00%	1/10W
R30	1-216-025-91	RES, CHIP	100	5.00%	1/10W
R31	1-216-073-00	RES, CHIP	10K	5.00%	1/10W
R32	1-216-077-00	RES, CHIP	15K	5.00%	1/10W
R33	1-216-041-00	RES, CHIP	470	5.00%	1/10W
R34	1-216-065-91	RES, CHIP	4.7K	5.00%	1/10W
R35	1-216-065-91	RES, CHIP	4.7K	5.00%	1/10W
R36	1-216-049-91	RES, CHIP	1K	5.00%	1/10W
R37	1-216-073-00	RES, CHIP	10K	5.00%	1/10W
		< VIBRATOR >			
X1	9-885-005-68	VIBRATOR (5.0MHz)			
X2	9-885-005-67	VIBRATOR,CRYSTAL (32.768kHz)			

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Ref. No.	Part No.	Description	Remarks
		MISCELLANEOUS	
		**********	
1	9-880-056-01	TTP	
2	9-885-007-67	LCD	
* 16	9-880-053-01	ZEBRA CONNECTOR	
EL1	9-880-153-01	ELECTRO LUMINESCENT	

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		ACCESSORIES & PACKING MATERIALS	
		**********	
	3-223-015-11	MANUAL, INSTRUCTION (ENGLISH, DUTCH)	
	3-223-015-21	MANUAL, INSTRUCTION (GERMAN, SPANISH)	
	3-223-015-31	MANUAL, INSTRUCTION (FRENCH, ITALIAN)	
	3-223-015-41	MANUAL, INSTRUCTION (SWEDISH, PORTUGESE)	
	3-223-019-11	INSTRUCTION (MAKER CORD LIST)	